IEI Technology Corp.

MODEL:

PCIE-9650

PICMG 1.3 LGA775 Intel® Core™2 Quad CPU Card with VGA, Dual PCIe GbE, SATA II with RAID, and USB 2.0

User Manual

Rev. 1.10 JANUARY 2008

RoHS Lead Free

Revision

Date	Version	Changes
January, 2008	1.10	Added and updated images and data flow. Updated dimensions diagrams.
April, 2007	1.00	Initial release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the PCIE-9650 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the PCIE-9650. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the PCIE-9650. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the PCIE-9650. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PCIE-9650 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the PCIE-9650 package.

- 1 x PCIE-9650
- 1 x Mini jumper pack
- 6 x SATA cable
- 3 x SATA power cable
- 1 x Dual RS-232 cable
- 1 x USB cable
- 1 x Utility CD
- 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 Introduction

Figure 1-1: PCIE-9650

The PCIE-9650 PICMG 1.3 form factor CPU card is a LGA775 Intel® Core™2 Quad, Pentium® D, Pentium® 4 or Celeron® D platform. Up to 8GB of DDR2 SDRAM and up to six SATA II hard disk drives (HDD) with RAID 0, 1, 5 and 10 capabilities are supported. High-performance PCI Express (PCIe) Gigabit Ethernet (GbE) connectivity is integrated into the system. Six USB 2.0 connectors (two external and four internal) enable system flexibility and expansion.

1.2 Features

Some of the PCIE-9650 features are listed below.

- Supports LGA775 Intel® CPUs including:
  - Intel® Core™2 Quad
  - Intel® Core™2 Duo
  - Intel® Pentium® D
  - Intel® Pentium® 4
  - Intel® Celeron® D
- Maximum FSB of 1066 MHz
- Supports four 240-pin (2.0 GB max.) 533 MHz, 667 MHz or 800 MHz dual-channel DDR2 memory modules (8.0 GB system max.)
- Six SATA II drives with transfer rates of 3.0 Gb/s and RAID 0, 1, 5 and 10

capabilities supported

- Ten USB 2.0 devices supported
- Dual PCIe GbE Ethernet connectors
- PICMG 1.3 form factor
- RoHS compliant
- Supports ATX power supplies

1.3 Overview

The PCIE-9650 has a wide variety of peripheral interface connectors. Below is a labeled photo of the peripheral interface connectors on the PCIE-9650.

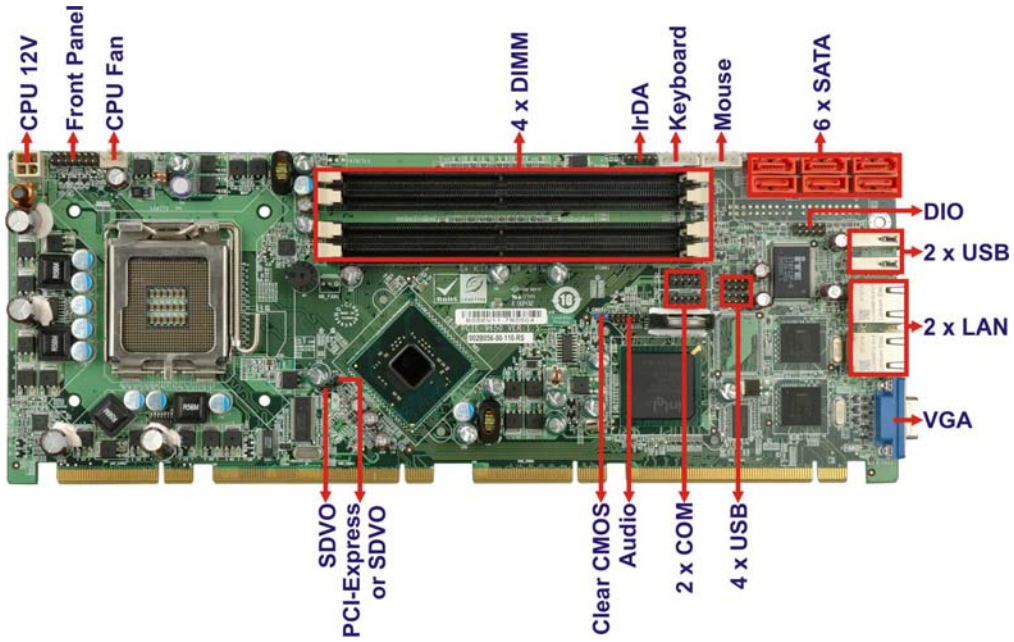

Figure 1-2: Overview

1.4 Peripheral Connectors and Jumpers

The PCIE-9650 has the following connectors on-board:

- 1 x ATX power connector
- 1 x Audio connector
- 1 x Digital input/output connector
- 1 x Fan connector

- 1 x Front panel connector
- 1 x Infrared interface connector
- 1 x Keyboard connector
- 1 x Mouse connector
- 6 x Serial ATA II (SATA II) drive connectors
- 2 x Serial port connectors
- 4 x USB 2.0 connectors

The PCIE-9650 has the following external peripheral interface connectors on the board rear panel

- 2 x Ethernet connectors
- 2 x USB 2.0 port connectors
- 1 x VGA connector

The PCIE-9650 has the following on-board jumpers:

- Clear CMOS

1.5 Technical Specifications

PCIE-9650 technical specifications are listed below. See **Chapter 2** for details.

Specification	PCIE-9650
Form Factor	PICMG 1.3
System CPU	LGA775 Intel® Core™ 2 Quad LGA775 Intel® Core™ 2 Duo LGA775 Intel® Pentium® D LGA775 Intel® Pentium® 4 LGA775 Intel® Celeron® D
Front Side Bus	533MHz, 800MHz or 1066MHz
System Chipset	**Northbridge**: Intel® Q965 **Southbridge**: Intel® ICH8DO

Memory	Four dual channel 240-pin DDR2 DIMM sockets support four 533MHz, 667MHz or 800MHz DIMMs with a maximum capacity each with a maximum capacity of 2GB
Display	VGA integrated into the Intel® Q965
BIOS	AMI Flash BIOS
Audio	7.1 channel HD audio kit with Realteck ALC883 and dual audio streams supported
LAN	Dual Intel® PC82573L PCIe GbE chipset
COM	Two RS-232 serial ports (two internal, one external)
USB2.0	Ten USB 2.0 devices supported
SATA	Six 3.0Gb/s SATA II drives supported
Keyboard/mouse	One internal keyboard connector One internal mouse connector
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	ATX power only
Power Consumption	5V@8.93A, 12V@7.42A and 3.3V@6.42A (Intel® Core™2 Extreme QX6700 2.66GHz, 4GB 800MHz DDR2)
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	338mm x 122mm
Weight (GW/NW)	1200g/ 474g

Table 1-1: Technical Specifications

1.6 Expansion Options

The PCIE-9650 PICMG 1.3 form factor enables PCIe x16, PCIe x4, PCIe x1 and PCI expansion cards to easily be added to the PICMG 1.3 compatible backplane the PCIE-9650 is installed on. Expansion cards in the combinations shown in **Table 1-2** below can be installed on compatible backplanes.

	PCIe x16	PCIe x4	PCIe x1	PCI
Combination 1	1	1	0	4
Combination 2	1	0	4	4
Combination 3	0	1	1	4
Combination 4	0	0	5	4

Table 1-2: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the PCIE-9650 are shown below:

- **Length**: 338mm
- **Width**: 122mm

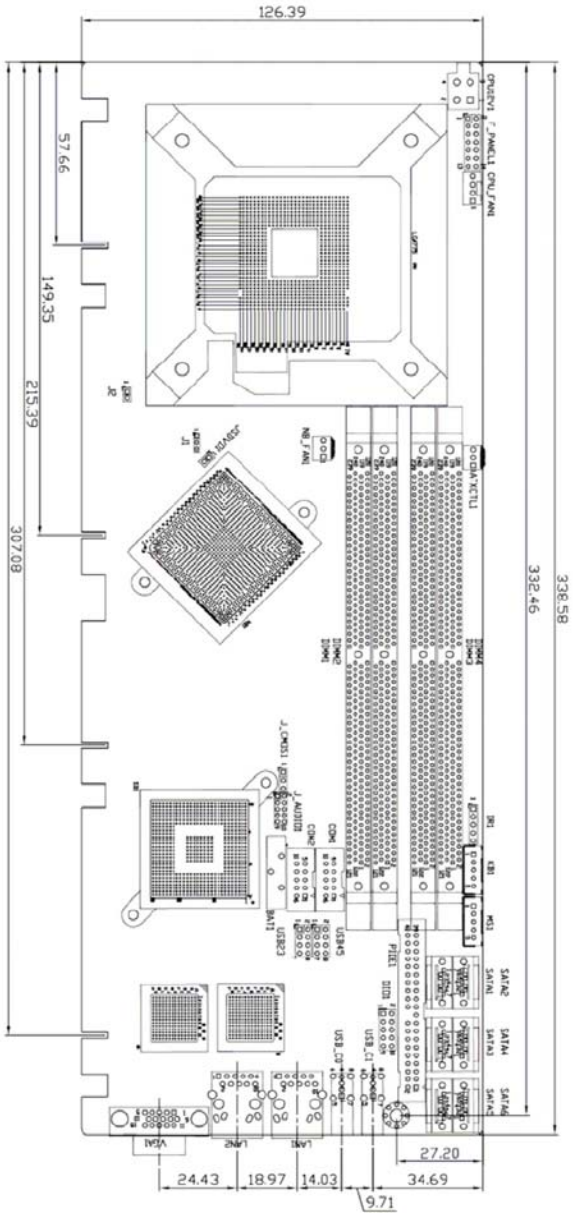

Figure 2-1: Dimensions (mm)

2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown below:

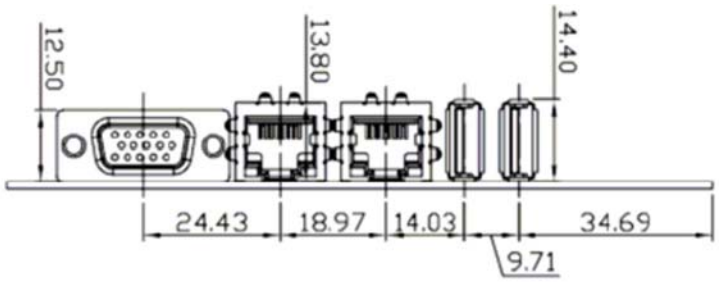

Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

The figure below shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

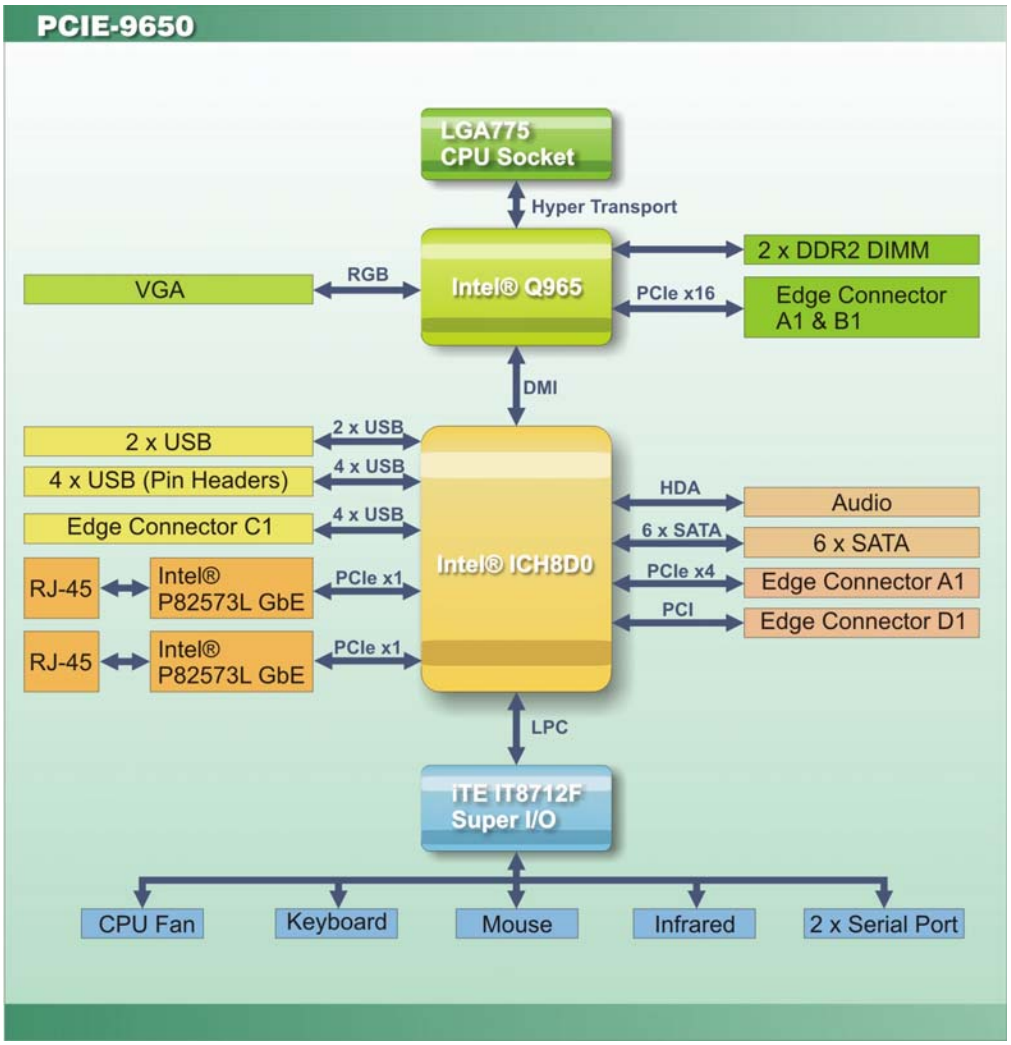

Figure 2-3: Data Flow Block Diagram

2.3 Compatible Processors

The PCIE-9650 supports the following LGA775 processors:

- Intel® Core™2 Quad
- Intel® Core™2 Duo

- Intel® Pentium® D
- Intel® Pentium® 4
- Intel® Celeron® D

Figure 2-4: LGA775 CPU Socket

All of the above processors are interfaced with an Intel® Q965 Northbridge chipset through the front side bus (FSB). Features of the supported processors are listed in sections below.

2.3.1 Intel® Core™2 Quad Features

Intel® Core™2 Quad features include:

- Four processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution
- Intel® Intelligent Power Capability
- Intel® Smart Memory Access
- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

2.3.2 Intel® Core™2 Duo Features

Intel® Core™2 Duo features include:

- Two processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution

- Intel® Intelligent Power Capability
- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

2.3.3 Intel® Pentium® 4 Features

Intel® Pentium® 4 features include:

- Hyper-Threading Technology
- Enhanced Intel® SpeedStep® Technology
- Intel® Extended Memory 64 Technology
- Execute Disable Bit

2.3.4 Intel® Pentium® D Features

Intel® Pentium® D features include:

- Dual core processing improves performance and multimedia management
- Intel® Visualization Technology
- Dual 2MB level 2 cache
- 800MHz FSB
- Execute Disable Bit
- Intel® Extended Memory 64 Technology
- Enhanced Intel® SpeedStep® Technology
- Streaming SIMD solutions

2.3.5 Intel® Celeron® D Features

Intel® Celeron® D features include:

- Intel® Extended Memory 64 Technology
- 512KB Level 2 cache
- 533MHz FSB
- Execute Disable Bit
- Streaming SIMD solutions

2.4 Intel® Q965 Northbridge Chipset

The Intel® Q965 GMCH supports LGA775 processors. The GMCH supports a FSB frequency of 533 MHz, 800 MHz or 1066 MHz.

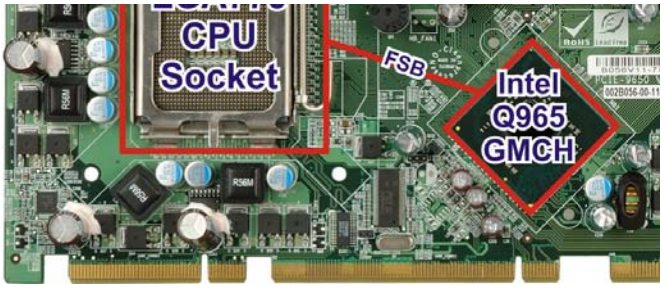

Figure 2-5: Intel® Q965 Northbridge Chipset

Some of the features of the Intel® Q965 GMCH include:

- Support for the following processors.
  - Intel® Core™2 Quad
  - Intel® Core™2 Duo
  - Intel® Pentium® D
  - Intel® Pentium® 4
  - Intel® Celeron® D
- Supports Hyper-Threading Technology (HT Technology)
- Supports FSB Dynamic Bus Inversion (DBI)
- Supports 36-bit host bus addressing, allowing the processor to access the entire
- 64 GB of the GMCH's memory address space
- Has a 12-deep In-Order Queue to support up to twelve outstanding pipelined address requests on the host bus
- Has a 1-deep Defer Queue
- Uses GTL+ bus driver with integrated GTL termination resistors
- Supports a Cache Line Size of 64 bytes

2.4.1 Memory Support

WARNING:

Only DDR2 memory module can be installed on the PCIE-9650. Do not install DDR memory modules. If a DDR memory module is installed on the PCIE-9650, the PCIE-9650 may be irreparably damaged.

The Intel® Q965 supports up to four 2GB DDR2 DIMMs with the following specifications:

- Only un-buffered DIMMs supported
- DDR2 only
- Maximum supported bandwidth (assuming DDR2 800 MHz):
  - ***Single-channel***: 6.4 GB/s
  - ***Dual-channel asymmetric mode***: 6.4 GB/s
  - ***Dual-channel interleaved mode***: 12.8 GB/s
- Capacities of 256MB, 512MB, 1GB or 2GB
- Transfer speeds of 533MHz, 667MHz or 800MHz

The memory sockets are shown below.

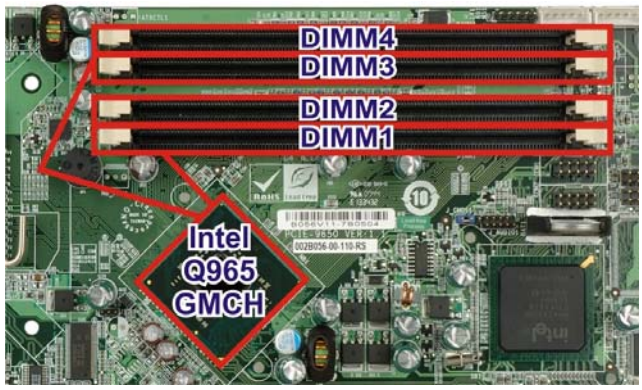

Figure 2-6: DDR2 DIMM Sockets

2.4.2 Analog CRT Support

A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® Q965 graphics engine. The Intel® Q965 internal graphics engine, with a 400MHz integrated 24-bit RAMDAC.

Figure 2-7: VGA Support

Some of the graphics features are listed below.

- Analog Display Support
- 400 MHz Integrated 24-bit RAMDAC
- Up to 2048x1536 @ 75 Hz refresh
- Hardware Color Cursor Support
- DDC2B Compliant Interface

2.4.3 PCIe x16 Bus Overview

The Intel® Q965 Northbridge has on 16-lane PCIe port that is intended for an external PCIe graphics card. The PCIe x16 graphics card is installed on a compatible PICMG 1.3 backplane and interfaced to the Northbridge through the edge connectors shown below. Note that the 16 lanes of the PCIe x16 Northbridge bus are connected through two edge connectors.

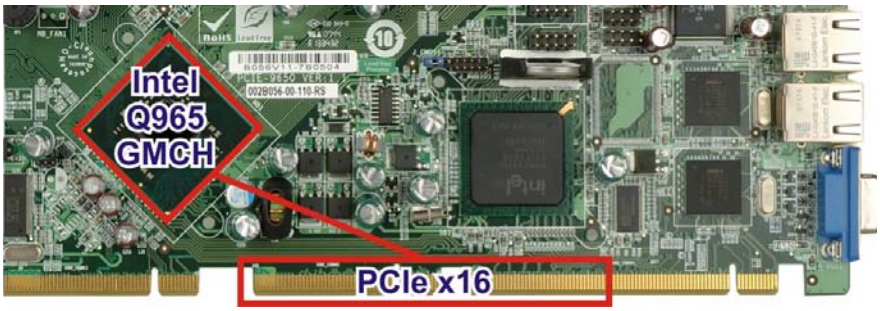

Figure 2-8: PCIe x16 Edge Connectors

2.4.3.1 Expansion Options

The PCIe x16 can be interfaced to either one PCIe x16 graphics card or a single PCIe x1 expansion card on a compatible PICMG 1.3 backplane.

2.4.3.2 Bus Specifications

The PCIe port is compliant with the *PCI Express* Base Specification* revision 1.1. The PCIe x16 port operates at a frequency of 2.5 Gb/s on each lane while employing 8b/10b encoding; the port supports a maximum theoretical bandwidth of 40 Gb/s in each direction. Some of the features are listed below.

- One, 16-lane PCIe port intended for graphics attach, compatible to the PCI Express* Base Specification revision 1.1a.
- PCI Express frequency of 1.25 GHz resulting in 2.5 Gb/s each direction
- Raw bit-rate on the data pins of 2.5 Gb/s results in a real bandwidth per pair of 250 MB/s given the 8b/10b encoding used to transmit data across this interface
- Maximum theoretical realized bandwidth on the interface of 4 GB/s in each direction simultaneously, for an aggregate of 8 GB/s when x16.
- PCI Express* Graphics Extended Configuration Space. The first 256 bytes of configuration space alias directly to the PCI Compatibility configuration space. The remaining portion of the fixed 4-KB block of memory-mapped space above that (starting at 100h) is known as extended configuration space.
- PCI Express Enhanced Addressing Mechanism. Accessing the device configuration pace in a flat memory mapped fashion.
- Automatic discovery, negotiation, and training of link out of reset

- Supports traditional PCI style traffic (asynchronous snooped, PCI ordering)
- Supports traditional AGP style traffic (asynchronous non-snooped, PCI Express relaxed ordering)
- Hierarchical PCI-compliant configuration mechanism for downstream devices (i.e., normal PCI 2.3 Configuration space as a PCI-to-PCI bridge)
- Supports “static” lane numbering reversal. This method of lane reversal is controlled by a Hardware Reset strap, and reverses both the receivers and transmitters for all lanes (e.g., TX[15]->TX[0], RX[15]->RX[0]). This method is transparent to all external devices and is different than lane reversal as defined in the PCI Express Specification. In particular, link initialization is not affected by static lane reversal.

2.5 Intel® ICH8DO Southbridge Chipset

The Intel® ICH8DO Southbridge chipset is connected to the Intel® Q965 Northbridge GMCH through the chip-to-chip Direct Media Interface (DMI).

Figure 2-9: Intel® ICH8DO Southbridge Chipset

Some of the features of the Intel® ICH8DO are listed below.

- Complies with PCI Express Base Specification, Revision 1.1
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions
- Integrated SATA host controller with DMA operations and AHCI support

interfaced to six SATA connectors on the PCIE-9650

- Supports the eight USB 2.0 devices on the PCIE-9650 with five UHCI controllers and two EHCI controllers
- Integrated 10/100/1000 GbE MAC with System Defense
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Intel High Definition Audio
- Supports Intel® Matrix Storage Technology
- Supports Intel® Active Management Technology (ICH8DO only)
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support
- Serial Peripheral Interface (SPI) support

2.5.1 Intel® High Definition Audio

The PCIE-9650 onboard audio connector can connect to an optional audio kit.

Figure 2-10: Intel® High Definition Audio

The codec on the optional audio kit is connected to the ICH8DO controller through the Intel® High Definition Audio serial link. The DMA engines in the controller move samples of digitally encoded data between system memory and the audio kit codec.

2.5.2 Low Pin Count (LPC) Interface

The ICH8DO LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH8DO is connected to the following components:

- Super I/O chipset

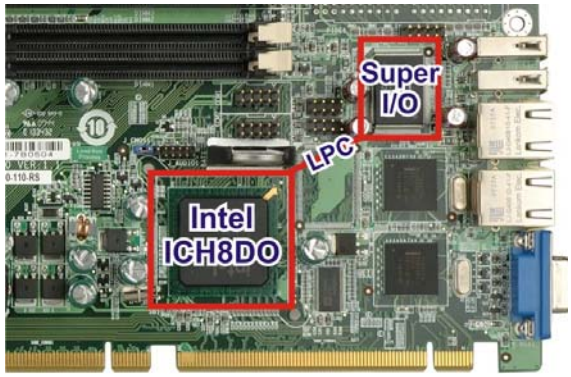

Figure 2-11: LPC Interface

2.5.3 PCI Interface

The PCI interface on the Intel® ICH8DO is compliant with the PCI Revision 2.3 implementation.

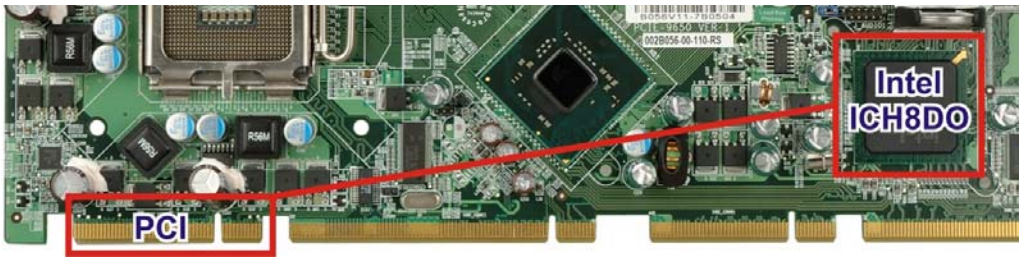

Figure 2-12: PCI Interface

Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

The PCI bus is connected to an edge connector on the bottom of the CPU cards and supports four expansion PCI cards on the backplane.

2.5.4 PCIe Bus Components

The PCIE-9659 Intel® ICH8DO Southbridge PCIe bus is split into two PCIe x1 channels and one PCIe x4 channel. One PCIe x1 channel is connected to a PCIe Gigabit Ethernet (GbE) controller. The PCIe x4 channel is connected to a golden finger on the bottom of the CPU card. The remaining PCIe x1 channel is shared with the GLCI (Gigabit LAN Connect Interface) bus, which is in turn connected to a GbE controller.

2.5.4.1 PCIe x4 Edge Connector

The PCIe x4 from the Southbridge consists of four lanes. The four lanes are connected to the edge connector shown below.

Figure 2-13: PCIe x4 Edge Connector

The PCIe x4 is interfaced to one PCIe x4 expansion card or four PCIe x1 expansion cards on a compatible PICMG 1.3 backplane.

2.5.4.2 PCIe Gigabit Ethernet (GbE) Controller

There are two Intel® PC82573L PCIe GbE controllers installed on the PCIE-9650. The Intel® PC82573L are interfaced through PCIe x1 channels to the Intel® ICH8DO. The Intel® PC82573L controllers are then connected to RJ-45 Ethernet connectors, enabling the PCIE-9650 to be connected to an external network.

Figure 2-14: Ethernet Controllers

The Intel® PC82573L controller is a low power 10/100/1000 Mb/s PCIe GbE controller that is ideal for non-managed platforms. Some of the Intel® PC82573L features are listed below.

- 2 Gbps peak bandwidth per direction
- PCI Express Rev 1.0a specification
- Wide, pipelined internal data path architecture
- Optimized transmit (Tx) and receive (Rx) queues
- 32 KB configurable Rx and Tx first-in/first-out (FIFO)
- IEEE 802.3x*-compliant flow-control support with software controllable pause times and threshold values
- Programmable host memory Rx buffers (256 B-16 KB)
- Descriptor ring management hardware for Tx and Rx
- Mechanism for reducing interrupts from Tx/Rx operations
- Integrated PHY for 10/100/1000 Mbps (full- and half-duplex)
- IEEE 802.3ab* auto-negotiation support
- IEEE 802.3ab PHY compliance and compatibility
- Tx/Rx IP, TCP, and UDP checksum offloading
- Tx TCP segmentation

2.5.5 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH8DO. The RTC operates on a 3V battery and 32.768KHz

crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.6 SATA Controller

The two integrated SATA controllers on the ICH8DO Southbridge support six SATA II drives on the PCIE-9650 with independent DMA operations. The SATA controller contains two modes of operation – a legacy mode using I/O space, and an AHCI mode using memory space.

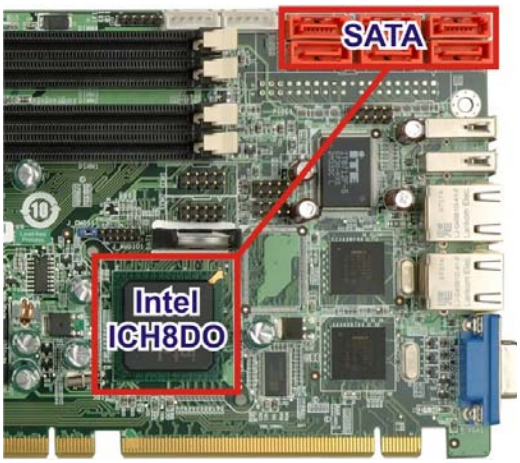

Figure 2-15: SATA Connectors

SATA controller specifications are listed below.

- Supports independent DMA operation on up to six ports
- Supports six SATA drives
- Supports 3Gb/s data transfer speeds
- Supports Serial ATA 1.0 Specification, Revision 1.0

2.5.7 Direct Media Interface (DMI)

Intel® Q965 Northbridge GMCH is connected to the Intel® ICH8DO Southbridge Chipset through the chip-to-chip Direct Media Interface (DMI). Features of the Intel® Q965 DMI are listed below:

- Chip-to-chip connection interface to Intel ICH8
- 2GB/s (1GB/s in each direction) bus speed

- 32-bit downstream address
- 100 MHz reference clock (shared with PCI Express Graphics Attach)
- APIC and MSI interrupt messaging support
- Message Signaled Interrupt (MSI) messages
- SMI, SCI and SERR error indication
- DMA, floppy drive, and LPC bus master

Figure 2-16: Direct Media Interface

2.5.8 USB Controller

Up to six high-speed, full-speed or low-speed USB devices are supported by the ICH8DO on the PCIE-9650. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH8DO integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH8DO integrated Universal Host Controller Interface (UHCI) controllers.

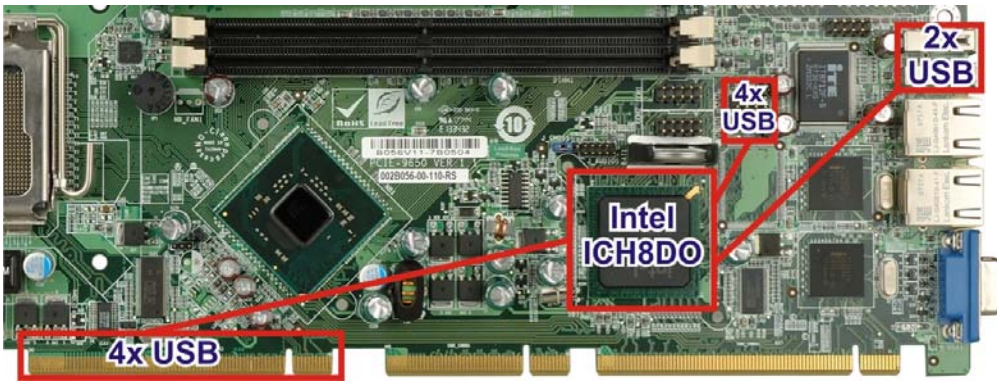

Figure 2-17: USB Interface

2.6 iTE IT8712F Super I/O Chipset

The iTE IT8712F Super I/O chipset is connected to the ICH8DO Southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with Environment Controller integration.

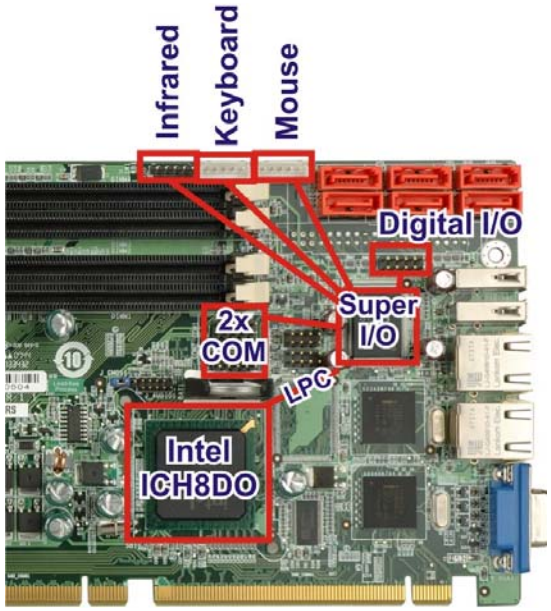

Figure 2-18: Super I/O Chipset Components

Some of the features of the iTE IT8712F chipset are listed below:

- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail in the following sections.

2.6.1 LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.6.2 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

2.6.3 Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.6.4 Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.6.5 Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.7 Environmental and Power Specifications

2.7.1 System Monitoring

Three thermal inputs on the PCIE-9650 Super I/O Enhanced Hardware Monitor monitors the following temperatures:

- System temperature
- Power temperature
- CPU temperature

Eight voltage inputs on the PCIE-9650 Super I/O Enhanced Hardware Monitor monitors the following voltages:

- Vcore
- +2.5V
- +3.3V
- +5.0V
- +12.0V
- DDR Vtt
- +1.5V
- 5VSB

The PCIE-9650 Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

The PCIE-9650 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.7.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the PCIE-9650 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the Northbridge and Southbridge chipsets to ensure the operating temperature of these chips remain low.

2.7.3 Power Consumption

The table below shows the power consumption parameters for the PCIE-9650 running with a 2.66GHz Intel® Core™2 Extreme QX6700 processor with 4GB of 800MHz DDR2 memory.

Voltage	Current
+3.3V	6.42
+5V	8.93A
+12V	7.42A

Table 2-1: Power Consumption

2.8 Expansion Options

2.8.1 Expansion Options Overview

A number of compatible IEI Technology Corp. PICMG 1.3 backplanes and chassis can be used to develop and expanded system. These backplanes and chassis are listed below.

2.8.2 IEI PICMG 1.3 Backplanes

The backplanes listed in the table below are compatible with the PCIE-9650 and can be used to develop highly integrated industrial applications. All of the backplanes listed below have 24-pin ATX connector and a 4-pin ATX connector (except the PE-16SD with one 24-pin and three 20-pin connectors). For more information about these backplanes please consult the IEI catalog or contact your vendor, reseller or the IEI sales team at sales@iei.com.tw.

Model	Total Slots	PCIe Slots				PCI-X Slots	PCI Slots	Compatible Chassis
		x16	x8	x4	x1			
SPE-4S	4		2	1				PAC-106G, PAC-107G, PAC-1000G, PAC-506G
SPE-6S	6			5				PAC-106G, PAC-107G, PAC-1000G, PAC-506G
SPE-9S	9		2	3			3	PAC-125G
SPXE-9S	9		2	2		2	2	PAC-125G
SPXE-14S	14		2					RACK-305G, RACK-360G, RACK-814G, RACK-3000G

Table 2-2: Compatible IEI PICMG 1.3 Active Backplanes

Model	Total Slots	PCIe Slots			PCI Slots	USB	Compatible Chassis
		x16	x4	x1			
PE-4S	4	1	1		1	4	PAC-42GF-R20, PACO-504F
PE-4S2	4	1			2	4	PAC-42GF-R20, PACO-504F
PE-4S3	4	1		2		4	PAC-42GF-R20, PACO-504F
PE-5S	5	1	1		2	4	RACK-500G-R20
PE-5S2	5	1		3		4	RACK-500G-R20
PE-6S	6	1		2	2	4	RACK-305G-R20, RACK-360G-R20, RACK-814G-R20, RACK-3000G-R20, PAC-1700G-R20, PAC-125G-R20
PE-6S2	6	1	1		3	4	PAC-106G-R20, PAC-107G-R20, PAC-1000G-R20, PACO-506F
PE-6S3	6	1		3	1	4	PAC-1000G-R20, PACO-506F
PE-6SD	5	1		3		4	RACK-221G, RACK-2100G
PE-6SD2	5	1		2	1	4	RACK-221G, RACK-2100G
PE-6SD3	5	1	1	2	2	4	RACK-221G, RACK-2100G

Model	Total Slots	PCIe Slots			PCI Slots	USB	Compatible Chassis
		x16	x4	x1			
PE-7S	7	1		2	3	4	PAC-1700G-R20
PE-7S2	7	1		4	1	4	PAC-1700G-R20
PE-8S	8	1		3	3	4	PAC-125G-R20
PE-9S	9	1		4	3	4	
PE-10S	10	1		4	4	4	RACK-305G-R20, RACK-360G-R20, RACK-814G-R20, RACK-3000G-R20
PE-10S2	10	1		4	4	4	RACK-305G-R20, RACK-360G-R20, RACK-814G-R20, RACK-3000G-R20
PE-13SD	13	1/1	1/0	0/4	2/2	8	RACK-305G-R20, RACK-360G-R20, RACK-814G-R20, RACK-3000G-R20
PE-16SD	16	4	4	0	4	16	RACK-4000-R20 (Quad System)
PXE-13S	13	1		3	8	4	RACK-305G-R20, RACK-360G-R20, RACK-814G-R20, RACK-3000G-R20
PXE-19S	19	1		1	16	4	RACK-3200G-R20, RACK-3035G-R20

Table 2-3: Compatible IEI PICMG 1.3 Passive Backplanes

2.8.3 IEI Chassis

IEI chassis available for PCIE-9650 system development are listed in the table below.

For more information about these chassis please consult the IEI catalog or contact your vendor, reseller or the IEI sales team at sales@iei.com.tw.

Model	Mounting	Backplane
RACK-220G/221G	Rack	PE-6SD-R40, PE-6SD2-R40, PE-6SD3-RS-R40
RACK-2000G/2100G	Rack	PE-6SD-R40, PE-6SD2-R40, PE-6SD3-RS-R40

Model	Mounting	Backplane
RACK-305G	Rack	PE-6S-R40, PE-10S-R40, PE-10S2-R40, PE-13SD-R40, PXE-13S-R40, SPXE-14S
RACK-360G	Rack	PE-6S-R40, PE-10S-R40, PE-10S2-R40, PE-13SD-R40, PXE-13S-R40, SPXE-14S
RACK-814G	Rack	PE-6S-R40, PE-10S-R40, PE-10S2-R40, PE-13SD-R40, PXE-13S-R40, SPXE-14S
RACK-3000G	Rack	PE-6S-R40, PE-10S-R40, PE-10S2-R40, PE-13SD-R40, PXE-13S-R40, SPXE-14S
RACK-4000B	Rack	PE-16SQ-RS-R40
RACK-3200G	Rack	PXE-19S-R40
RACK-500G	Rack	PE-5S-R40, PE-5S2-R40
RACK-3035G	Rack	PXE-19S-R40
PAC-42GF	Standing	PE-4S-R40, PE-4S2-R40, PE-4S3-R40
PAC-1000G	Standing	PE-6S2-R40, PE-6S3-R40, SPE-4S-R10, SPE-6S-R10
PAC-106G	Standing	PE-6S2-R40, PE-6S3-R40, SPE-4S-R10, SPE-6S-R10
PAC-107G	Standing	PE-6S2-R40, PE-6S3-R40, SPE-4S-R10, SPE-6S-R10
PAC-1700G	Standing	PE-7S-R40, PE-7S1-R40
PAC-125G	Standing	PE-6S2-R40, PE-6S3-R40, SPE-4S-R10, SPE-6S-R10

Table 2-4: Compatible IEI Chassis

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PCIE-9650 may result in permanent damage to the PCIE-9650 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-9650. Dry climates are particularly susceptible to ESD. It is therefore critical that whenever the PCIE-9650 or any other electronic component is handled, the following anti-static precautions are strictly adhered to:

- **Wear and anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the PCIE-9650.
- **Self-grounding:** - Before handling the PCIE-9650 touch any grounded conducting material. During the time of handling, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** - When configuring the PCIE-9650, place it on an anti-static pad. This reduces the possibility of ESD damaging the PCIE-9650.
- **Only handle the PCB by the edges:** - When handling the PCB, hold the PCB by it's edges.

3.2 Unpacking Precautions

When the PCIE-9650 is unpacked, please do the following:

- Follow the anti-static precautions outlined above.
- Make sure the packing box if facing upwards so the PCIE-9650 does not fall out of the box.
- Make sure all of the components shown in **Section 3.3.1** are present.

3.3 Unpacking Checklist

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor that the PCIE-9650 was purchased from, or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

3.3.1 Package Contents

The PCIE-9650 is shipped with the following components.

Quantity	Item and Part Number	Image
1	PCIE-9650	
3	SATA cable (**P/N**: 32000-062800-RS)	
1	SATA power cable (**P/N**: 32100-088600-RS)	
1	Dual RS-232 cable (**P/N**: 19800-000051-RS)	
1	Dual USB cable (w bracket) (**P/N**: CB-USB02-RS)	
1	Utility CD	

Quantity	Item and Part Number	Image
1	Mini jumper pack (2.0mm) (**P/N**: 33100-000033-RS)	

Table 3-1: Packing List Items

3.3.2 Optional Components

The following optional components are available for the PCIE-9650.

Item and Part Number	Image
Winbond TPM module (**P/N**: TPM-WI01-R10)	
Infineon TPM module (**P/N**: TPM-IN01-R10)	
Audio kit_ 7.1 Channel (**P/N**: AC-KIT-883HD-R10)	
CPU cooler (**P/N**: CF-775A-RS)	
FDD cable (**P/N**:32200-000017-RS)	

Item and Part Number	Image
PS2 cable for KB and MS (**P/N**: 19800-000066-RS)	

Table 3-2: Optional Items

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Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.1 shows peripheral interface connector locations. Section 4.1.2 lists all the peripheral interface connectors seen in Section 4.1.1.

4.1.1 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

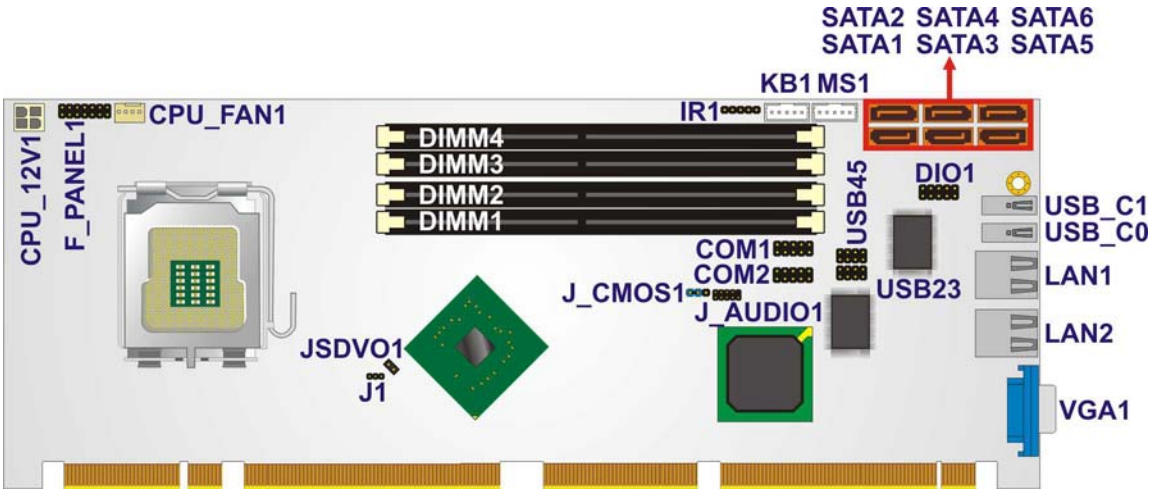


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the PCIE-9650.

Connector	Type	Label
ATX power connector	4-pin header	CPU12V1
Audio connector	9-pin header	J_AUDIO1
Cooling fan connector	4-pin header	CPU_FAN1
Digital input/output connector	10-pin header	DIO1
Front panel connector	10-pin header	F_PANEL1
Infrared (IrDA) connector	5-pin header	IR1

Connector	Type	Label
Keyboard connector	5-pin wafer	KB1
Mouse connector	5-pin wafer	MS1
Serial ATA drive connector	7-pin SATA	SATA1
Serial ATA drive connector	7-pin SATA	SATA2
Serial ATA drive connector	7-pin SATA	SATA3
Serial ATA drive connector	7-pin SATA	SATA4
Serial ATA drive connector	7-pin SATA	SATA5
Serial ATA drive connector	7-pin SATA	SATA6
Serial port connector (COM1)	10-pin header	COM1
Serial port connector (COM2)	10-pin header	COM2
USB connectors	8-pin header	USB23
USB connectors	8-pin header	USB45

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the PCIE-9650.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
USB port	USB port	USB_C0
USB port	USB port	USB_C1
VGA port connector	15-pin female	VGA

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the PCIE-9650.

4.2.1 ATX Power Connector

CN Label:	CPU12V1
CN Type:	4-pin ATX power connector (2x2)
CN Location:	See Figure 4-2
CN Pinouts:	See Table 4-3

The 4-pin ATX power connector is connected to an ATX power supply.

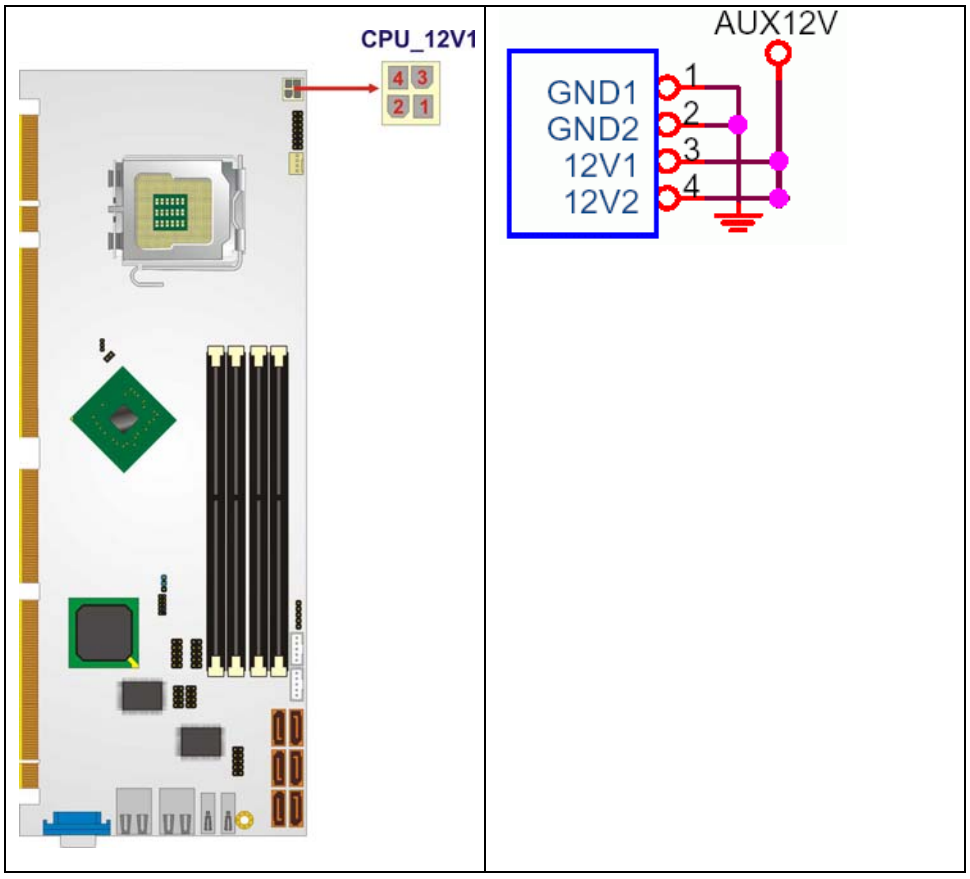


Figure 4-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 4-3: ATX Power Connector Pinouts

4.2.2 Audio Connector

CN Label: J_AUDIO1

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-3

CN Pinouts: See Table 4-4

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

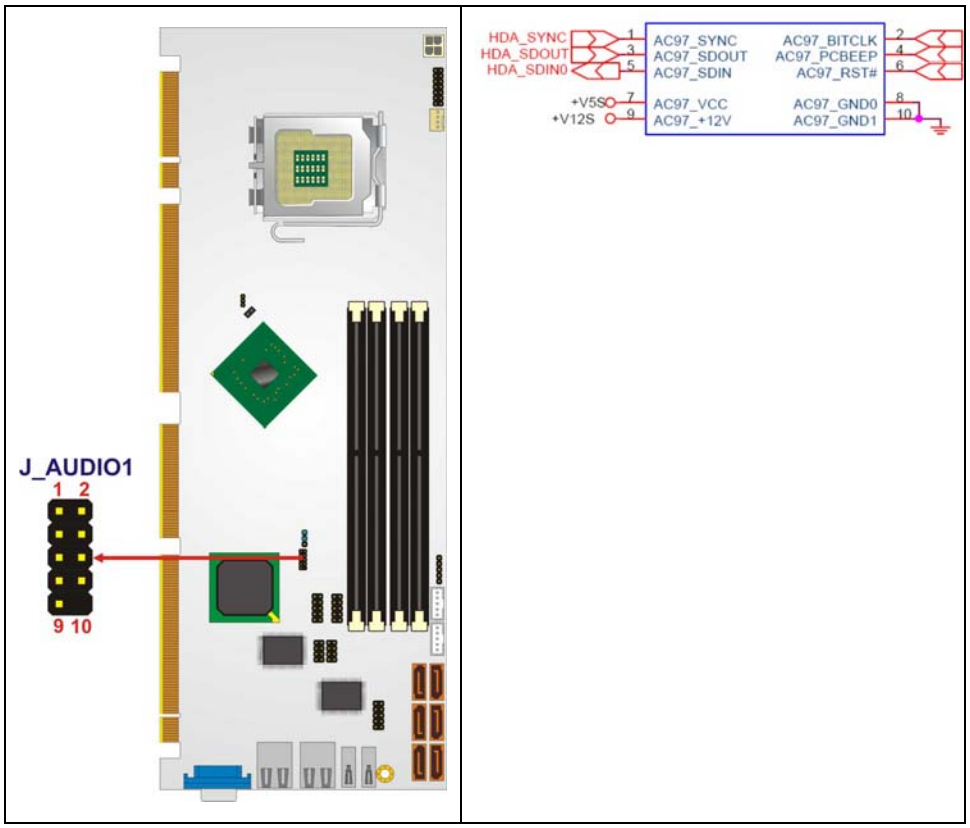


Figure 4-3: Audio Connector Location (9-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SYNC	2	BITCLK
3	SDOUT	4	PCBEEP
5	SDIN	6	RST#
7	VCC	8	GND
9	+12V	10	GND

Table 4-4: Audio Connector Pinouts

4.2.3 Digital Input/Output (DIO) Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-4

CN Pinouts: See Table 4-5

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

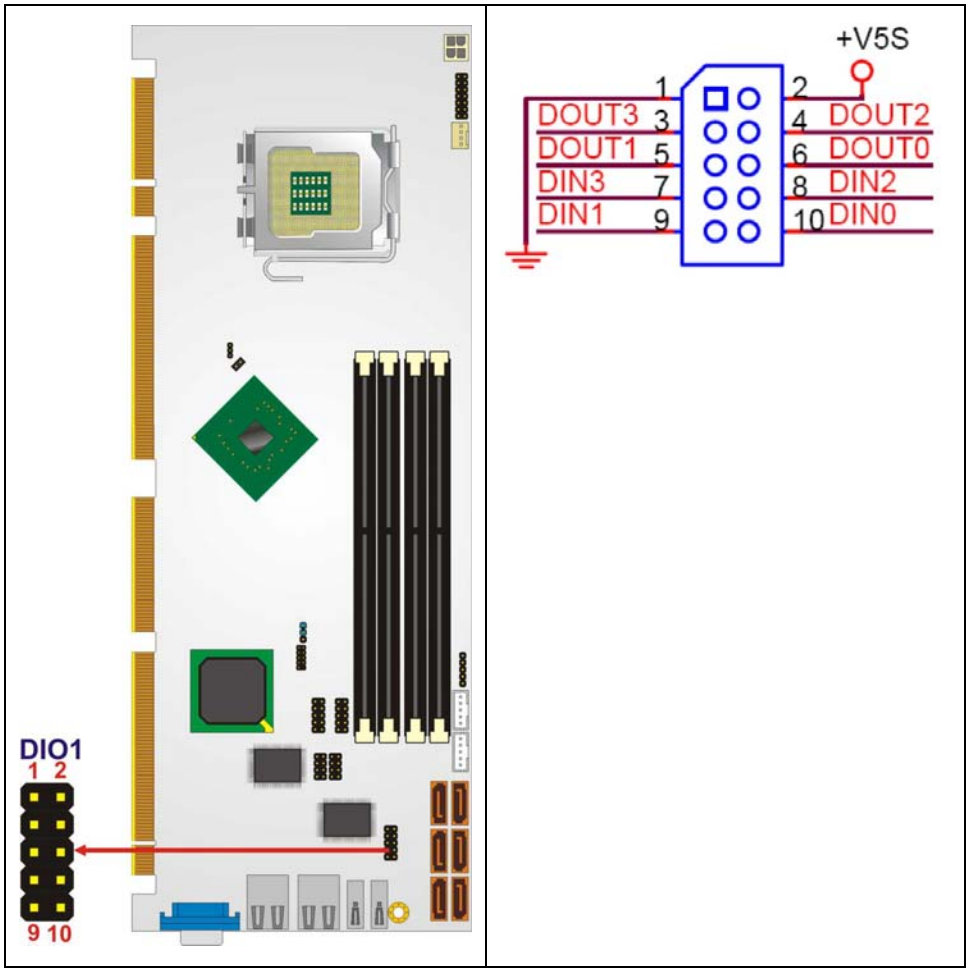


Figure 4-4: DIO Connector Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 1

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	Input 1	10	Input 0

Table 4-5: DIO Connector Pinouts

4.2.4 Fan Connector (+12V)

CN Label: CPU_FAN1

CN Type: 4-pin header

CN Location: See Figure 4-5

CN Pinouts: See Table 4-6

The cooling fan connector provides a 12V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

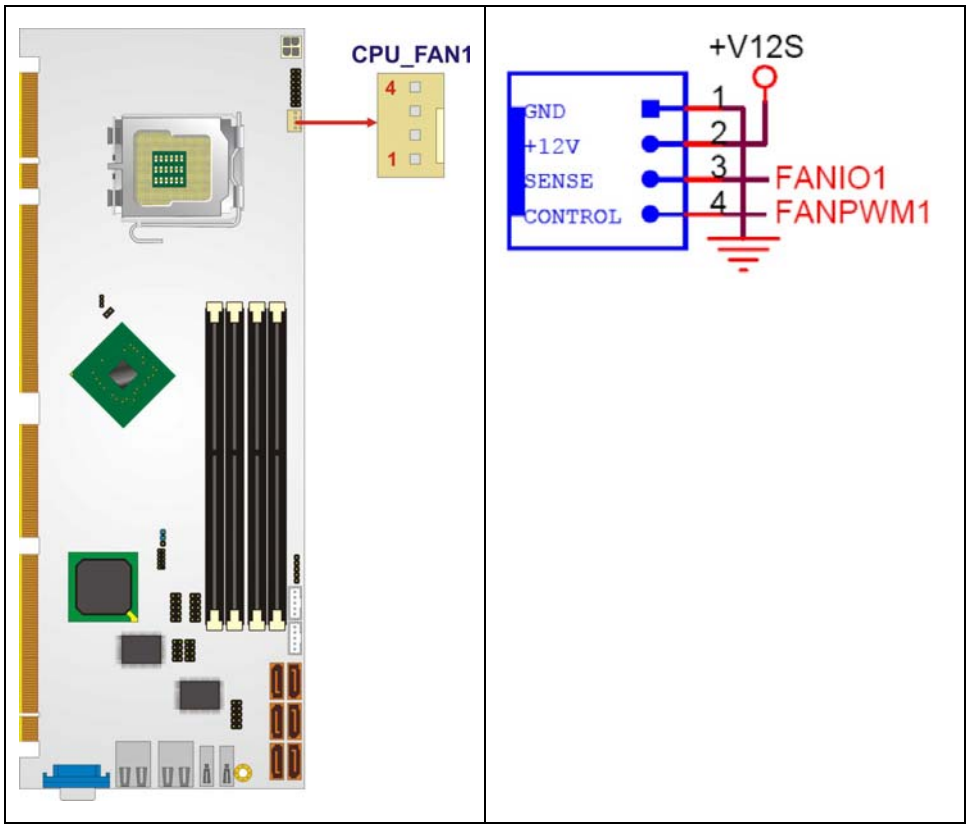


Figure 4-5: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Rotation Signal
4	Control

Table 4-6: +12V Fan Connector Pinouts

4.2.5 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x6)

CN Location: See Figure 4-6

CN Pinouts: See Table 4-7

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button
- Power LED
- HDD LED

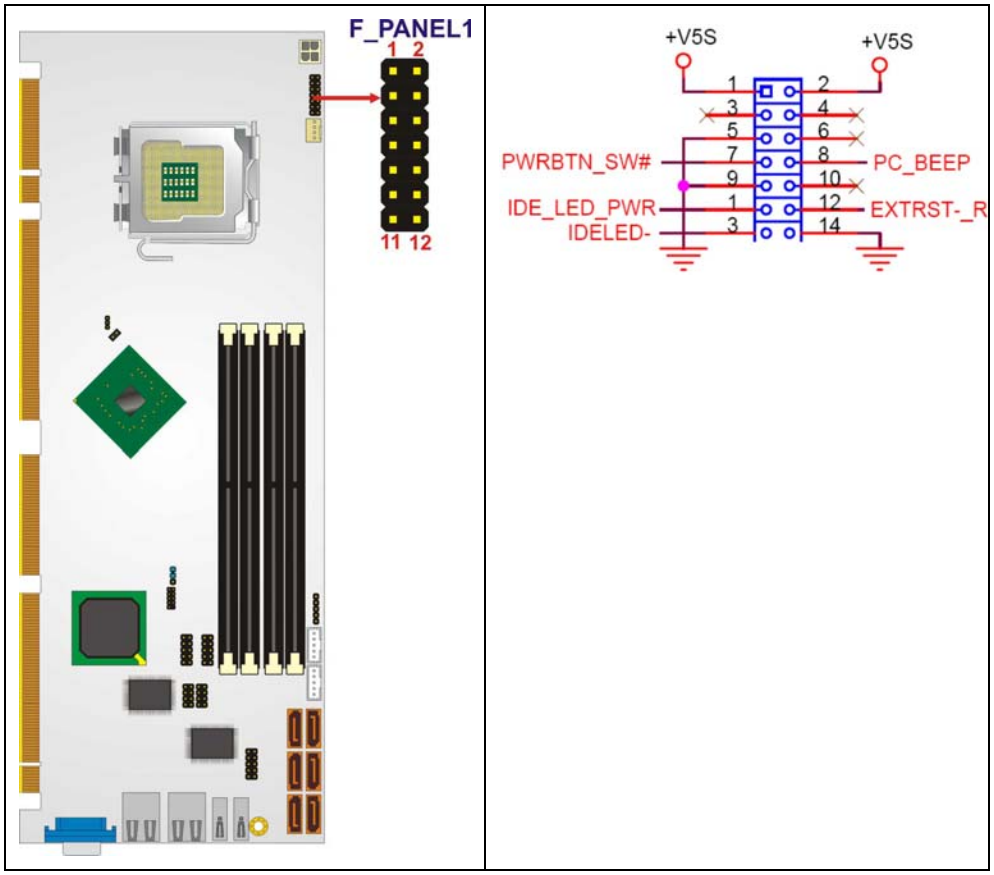


Figure 4-6: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	VCC	Speaker	2	VCC
	3	N/C		4	N/C
	5	Ground		6	N/C
Power Button	7	PWRBTN+		8	Speaker
	9	PWRBTN-	Reset	10	N/C

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
HDD LED	11	VCC		12	Reset-
	13	HDDLED-		14	GND

Table 4-7: Front Panel Connector Pinouts

4.2.6 Infrared Connector

CN Label: **IR1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-8**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

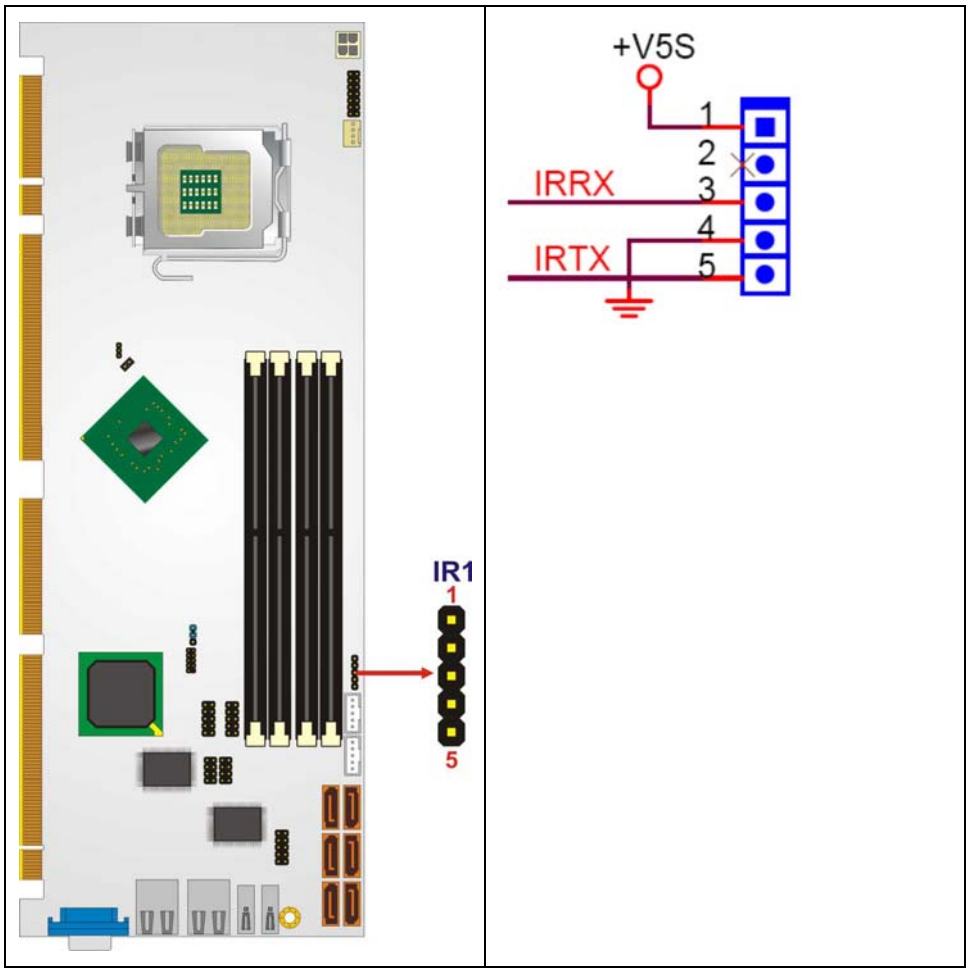


Figure 4-7: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	N/C
3	IR-RX
4	GND
5	IR-TX

Table 4-8: Infrared Connector Pinouts

4.2.7 Keyboard Connector

CN Label: **KB1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-9**

The keyboard connector can be connected to a standard PS/2 cable or PS/2 cable to add keyboard and mouse functionality to the system.

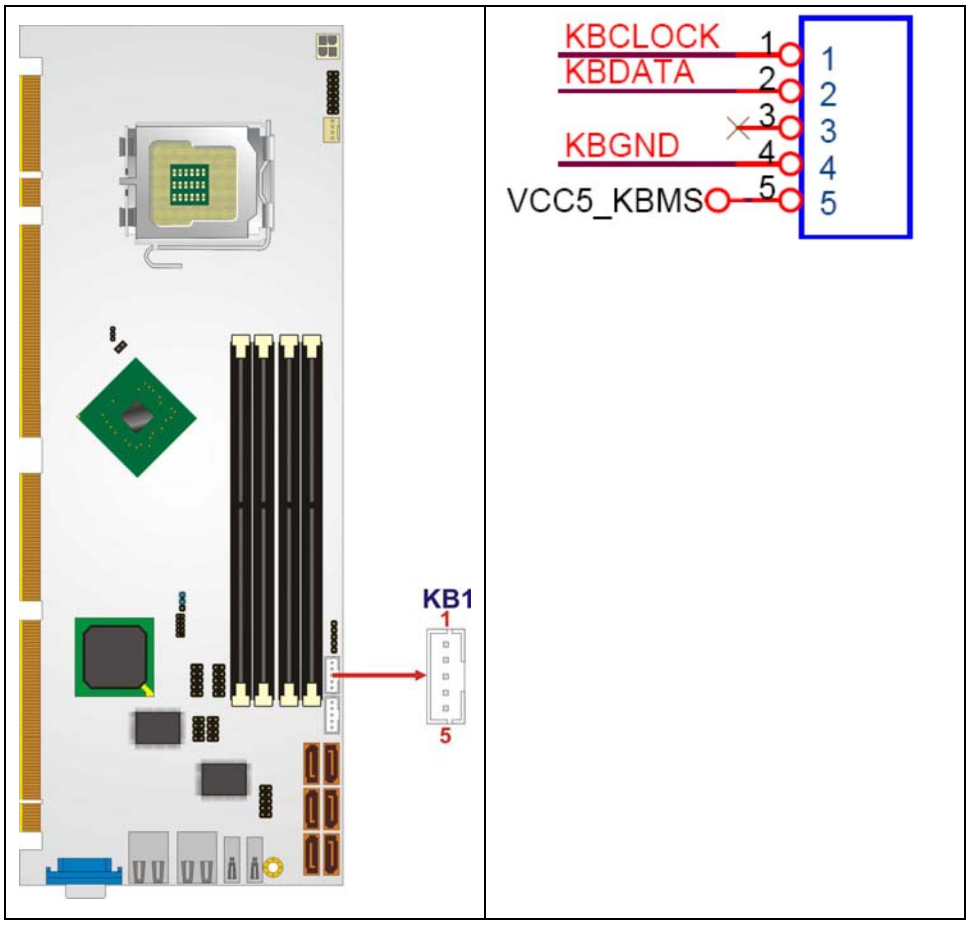


Figure 4-8: Keyboard Connector Location

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND

PIN NO.	DESCRIPTION
5	VCC

Table 4-9: Keyboard Connector Pinouts

4.2.8 Mouse Connector

CN Label: **MS1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-10**

The mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add mouse functionality to the system.

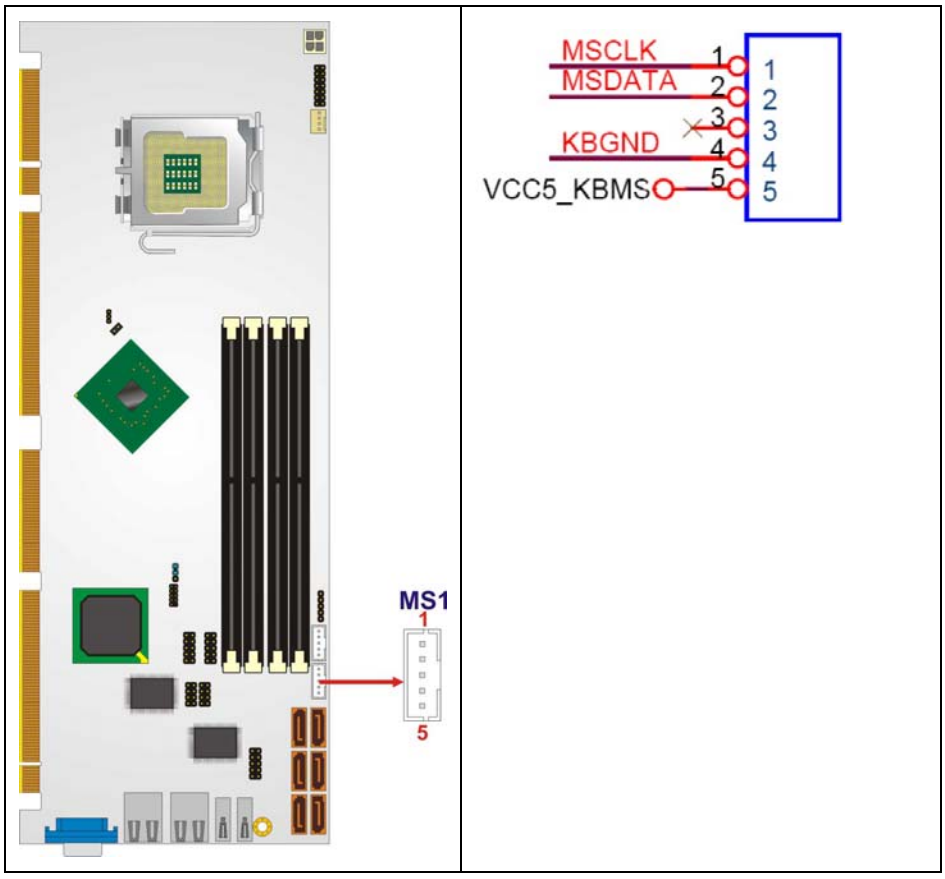


Figure 4-9: Mouse Connector Location

PIN NO.	DESCRIPTION
1	MOUSE CLOCK
2	MOUSE DATA
3	N/C
4	GROUND
5	VCC

Table 4-10: Mouse Connector Pinouts

4.2.9 SATA Drive Connectors

CN Label: SATA1, SATA2, SATA3, SATA4, SATA5 and SATA6

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-10

CN Pinouts: See Table 4-11

The two SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.

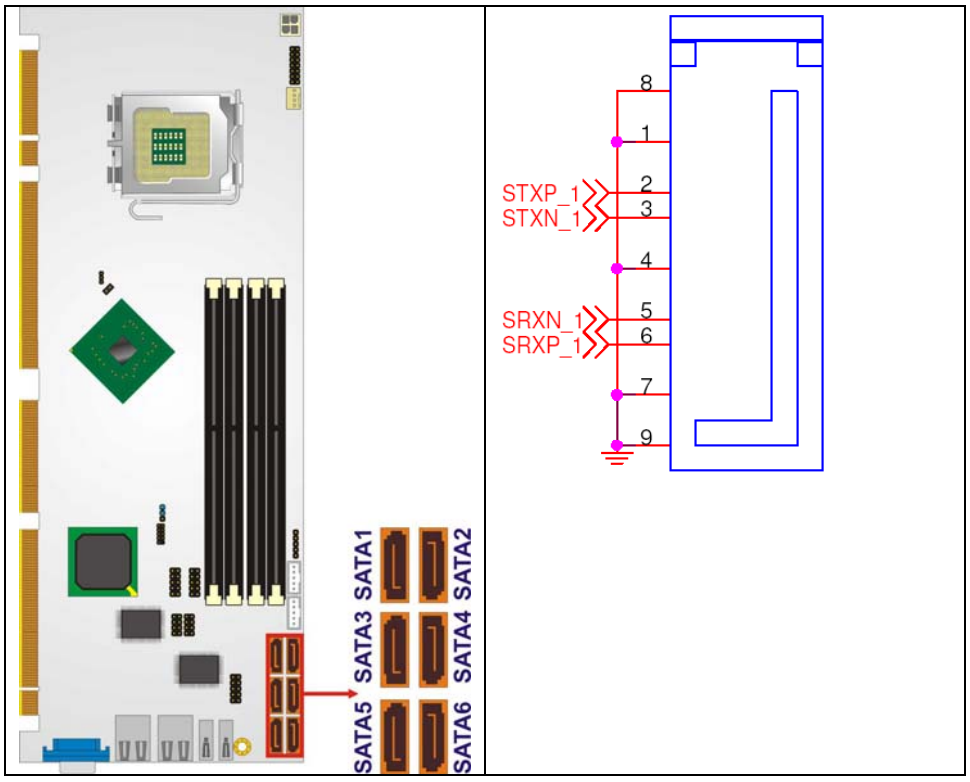


Figure 4-10: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-11: SATA Drive Connector Pinouts

4.2.10 Serial Port Connectors

CN Label: **COM1** and **COM2**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-12**

The 10-pin serial port connectors provide RS-232 serial communications channels. The serial port connector can be connected to external RS-232 serial port devices.

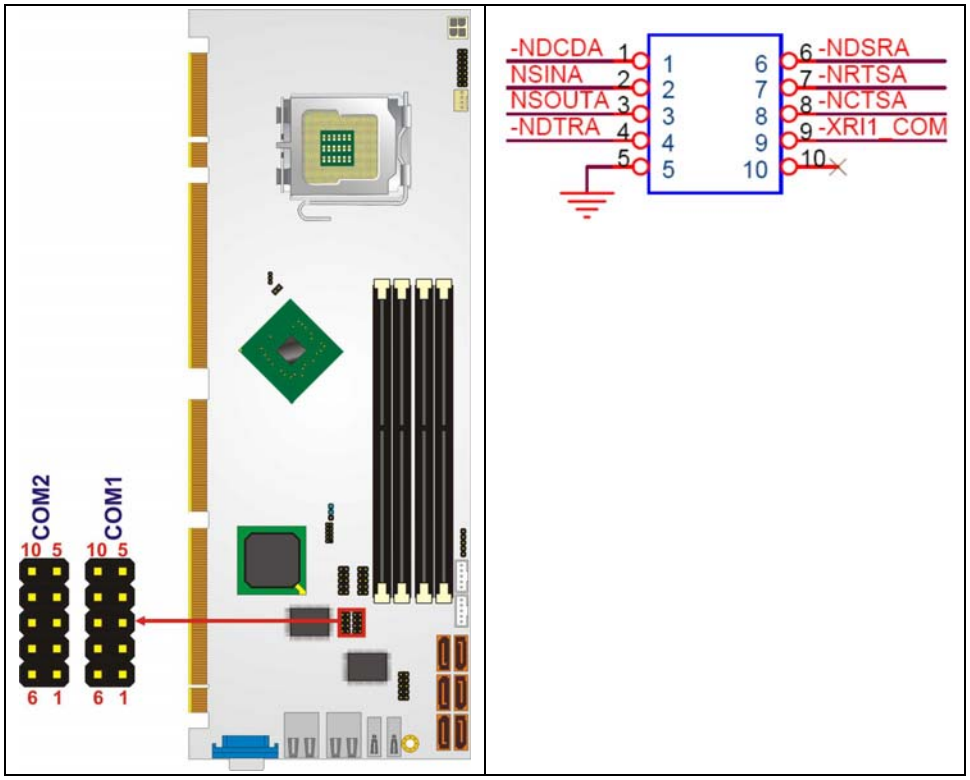


Figure 4-11: COM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)		

Table 4-12: COM Connector Pinouts

4.2.11 USB Connectors (Internal)

CN Label:	**USB1** and **USB2**
CN Type:	8-pin header (2x4)
CN Location:	See **Figure 4-12**
CN Pinouts:	See **Table 4-13**

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

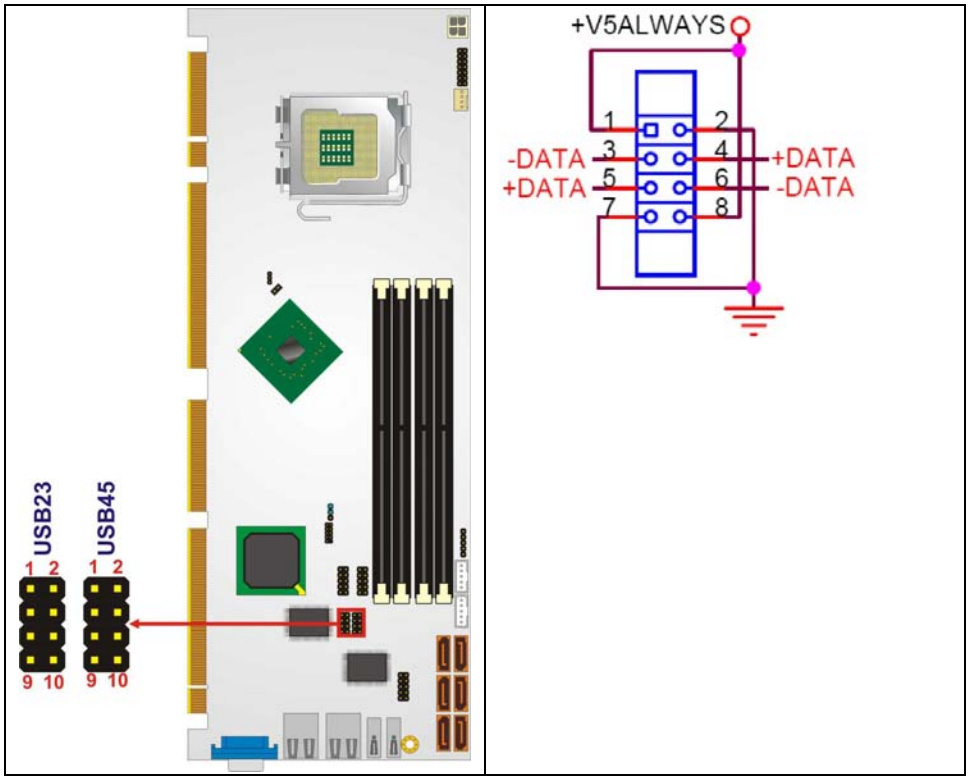


Figure 4-12: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
7	GND	8	VCC

Table 4-13: USB Port Connector Pinouts

4.3 External Peripheral Interface Connector Panel

Figure 4-13 shows the PCIE-9650 external peripheral interface connector (EPIC) panel. The PCIE-9650 EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 2 x USB connectors
- 1 x VGA connector

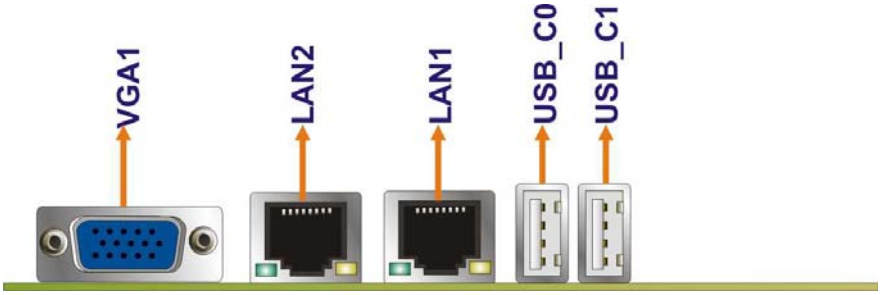


Figure 4-13: PCIE-9650 External Peripheral Interface Connector

4.3.1 LAN Connectors

CN Label: LAN1 and LAN2

CN Type: RJ-45

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-14**

The PCIE-9650 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXA+	5	TXC-

PIN	DESCRIPTION	PIN	DESCRIPTION
2	TXA-	6	TXB-
3	TXB+	7	TXD+
4	TXC+	8	TXD-

Table 4-14: LAN Pinouts

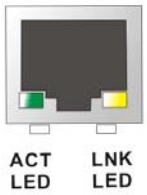


Figure 4-14: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-15**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 4-15: RJ-45 Ethernet Connector LEDs

4.3.2 USB Connector

CN Label: USB_C1 and USB_C0

CN Type: USB ports

CN Location: See Figure 4-13

CN Pinouts: See Table 4-16

The PCIE-9650 has four external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV3L 5V	1	USBV3L 5V

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	USBP4N	2	USBP5N
3	USBP4P	3	USBP5P
4	GND	4	GND

Table 4-16: USB Port Pinouts

4.3.3 VGA Connector

CN Label: VGA1

CN Type: 15-pin Female

CN Location: See Figure 4-13

CN Pinouts: See Figure 4-15 and Table 4-17

The PCIE-9650 has a single 15-pin female connector for connectivity to standard display devices.

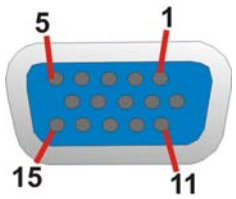


Figure 4-15: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC

PIN	DESCRIPTION	PIN	DESCRIPTION
15	DDCCLK		

Table 4-17: VGA Connector Pinouts

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PCIE-9650 may result in permanent damage to the PCIE-9650 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-9650. Dry climates are particularly susceptible to ESD. It is therefore critical that whenever the PCIE-9650 or any other electronic component is handled, the following anti-static precautions are strictly adhered to:

- **Wear and anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the PCIE-9650.
- **Self-grounding:** - Before handling the PCIE-9650 touch any grounded conducting material. During the time of handling, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** - When configuring the PCIE-9650, place it on an anti-static pad. This reduces the possibility of ESD damaging the PCIE-9650.
- **Only handle the PCB by the edges:** - When handling the PCB, hold the PCB by it's edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the PCIE-9650 in installed. All installation notices pertaining to the installation of the PCIE-9650 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the PCIE-9650 and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the PCIE-9650 and its accessories, and prevent injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the PCIE-9650 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the PCIE-9650 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the PCIE-9650 off:
  - When working with the PCIE-9650, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PCIE-9650 **DO NOT** do the following:

- **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the PCIE-9650 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The jumpers have been properly configured
- The PCIE-690AM2 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - SATA drives
  - Keyboard and mouse cable
  - Audio kit
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
- The following external peripheral devices are properly connected to the chassis:
  - Screen
  - Keyboard
  - Mouse
  - LAN

5.3 Unpacking

5.3.1 Unpacking Precautions

When the PCIE-9650 is unpacked, please do the following:

- Follow the anti-static precautions outlined above.
- Make sure the packing box is facing upwards so the PCIE-9650 does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 3** are present.

NOTE:

If some of the components listed in the checklist in **Chapter 3** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PCIE-9650 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

5.4 CPU, Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, PCIE-9650 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the PCIE-9650. If one of these component is not installed the PCIE-9650 cannot run.

5.4.1 LGA775 CPU Installation

NOTE:

Enabling Hyper-Threading Technology on your system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Pentium 4 Processor with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology (that has been met by the PCIE-9650)
- **OS**: An operating system that has optimizations for HT Technology

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 socket is shown below.

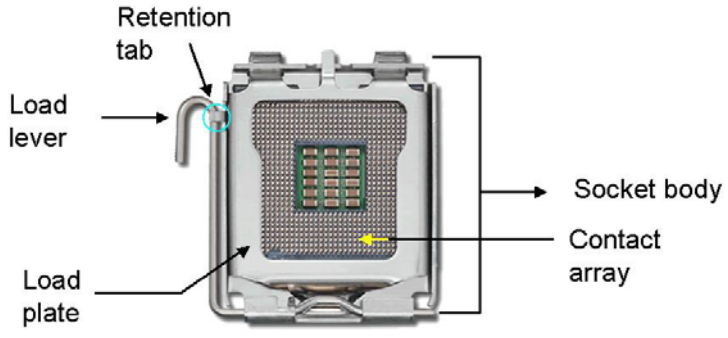


Figure 5-1: Intel LGA775 Socket

To install a socket LGA775 CPU onto the PCIE-9650, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use your fingernail to pry the protective cover off.

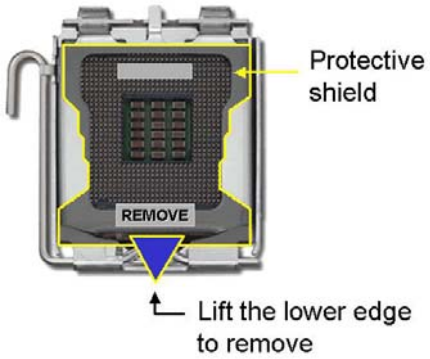


Figure 5-2: Remove the CPU Socket Protective Shield

Step 2: **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction.

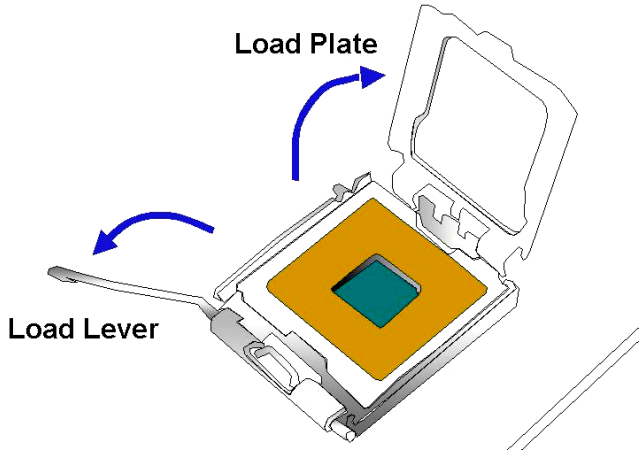


Figure 5-3: Open the CPU Socket Load Plate

Step 3: **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 5-4**.

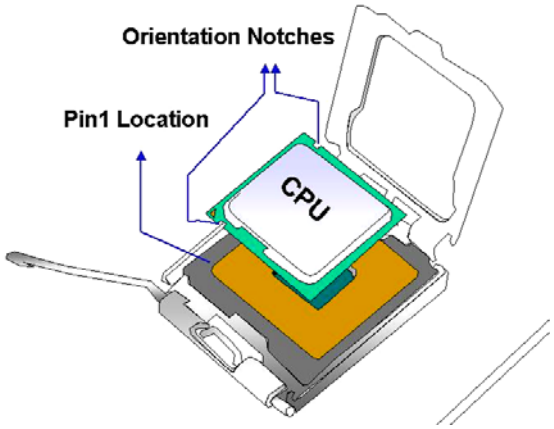


Figure 5-4: Insert the Socket LGA775 CPU

Step 8: **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

Step 9: **Connect the CPU 12V cable to the 12After the cooling kit is installed** connect the CPU cable to the CPU 12V power connector

5.4.2 LGA775 Cooling Kit Installation

WARNING:

It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the PCIE-9650.

IEI's cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

Figure 5-5: IEI CF-520 Cooling Kit

Figure 5-6: IEI CF-775A-RS Cooling Kit

Two optional, separately purchased LGA775 IEI CPU cooling kits are available. The IEI cooling fans are shown above and can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

Step 1: **Place the cooling kit onto the socket LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

Step 4: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes.

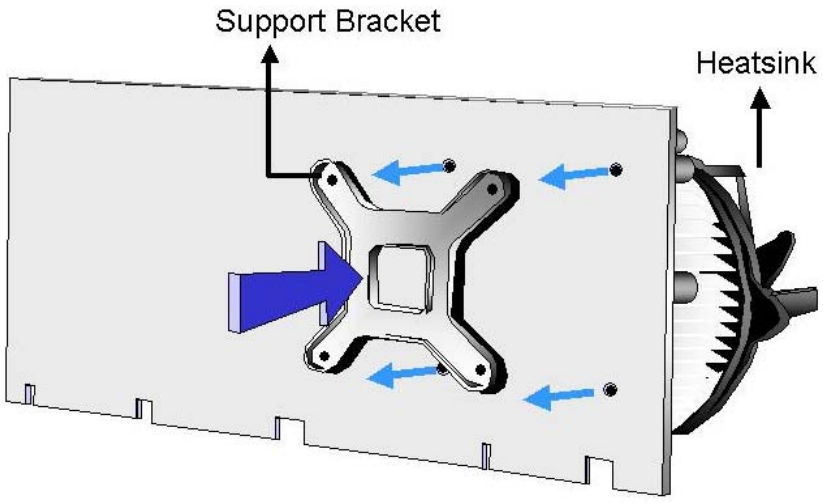


Figure 5-7: Securing the Heat sink to the PCB Board

Step 5: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the PCIE-9650. Carefully route the cable and avoid heat generating chips and fan blades.

5.4.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the PCIE-9650. Please make sure the purchased DIMM complies with the memory specifications of the PCIE-9650. DIMM specifications compliant with the PCIE-9650 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below.

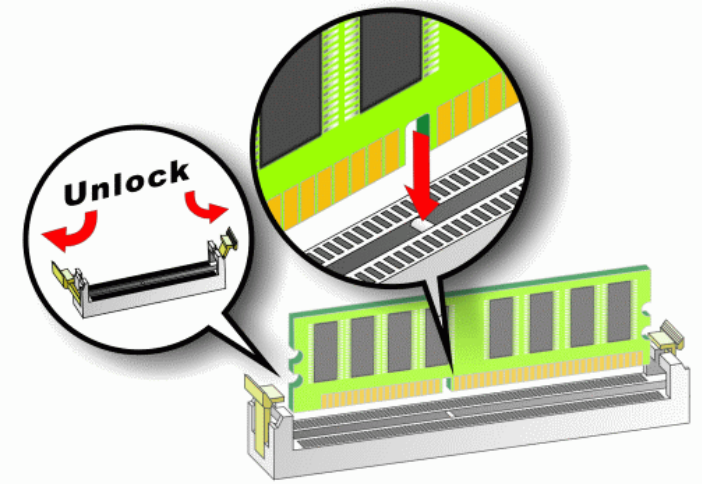


Figure 5-8: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-8**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-8**.

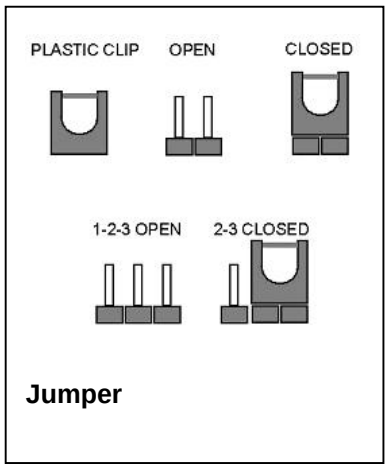
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-8**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.5 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the PCIE-9650 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the PCIE-9650 are listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header

Table 5-1: Jumpers

5.5.1 Clear CMOS Jumper

Jumper Label: J_CMOS1

Jumper Type: 3-pin header

Jumper Settings: See Table 5-2

Jumper Location: See Figure 5-9

If the PCIE-9650 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu. The clear CMOS jumper settings are shown in **Table 5-2**.

Jumper Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-9** below.

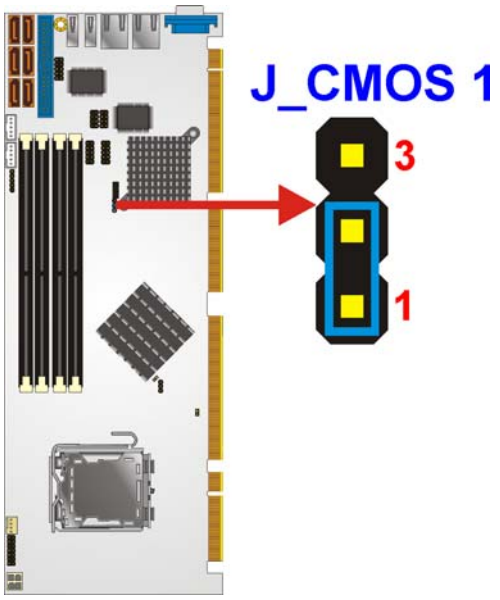


Figure 5-9: Clear CMOS Jumper

5.6 Chassis Installation

5.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the PCIE-9650 must have air vents to allow cool air to move into the system and hot air to move out.

The PCIE-9650 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your PCIE-9650 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.6.2 Backplane Installation

Before the PCIE-9650 can be installed into the chassis, a backplane must first be installed. Please refer to the installation instructions that came with the backplane and the chassis to see how to install the backplane into the chassis.

NOTE:

IEI has a wide range of backplanes available. Please contact your PCIE-9650 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.6.3 CPU Card Installation

To install the PCIE-9650 CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

5.7 Internal Peripheral Device Connections

5.7.1 Peripheral Device Cables

The cables listed in **Table 5-3** are shipped with the PCIE-9650.

Quantity	Type
1	ATA 66/100 flat cable
1	Dual RS-232 cable
1	5-pin wafer-to-PS/2 cable
6	SATA drive cables
3	SATA drive power cables
1	USB cable

Table 5-3: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- Audio kit
- 5-pin wafer-to-PS/2 cable
- 4-port USB cable
- PCIe x16 VGA output SDVO card
- PCIe x16 DVI output SDVO card

For more details about the items listed above, please refer to **Chapter 3**. Installation of the accessories listed above are described in detail below.

5.7.2 Audio Kit Installation

An optional audio kit that is separately ordered connects to the 9-pin audio connector on the PCIE-9650. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Front-In, Front-Out, Rear-Out and subwoofer connect to four speakers including a subwoofer. To install the audio kit, please refer to the steps below:

Step 1: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 2: **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 5-10**.

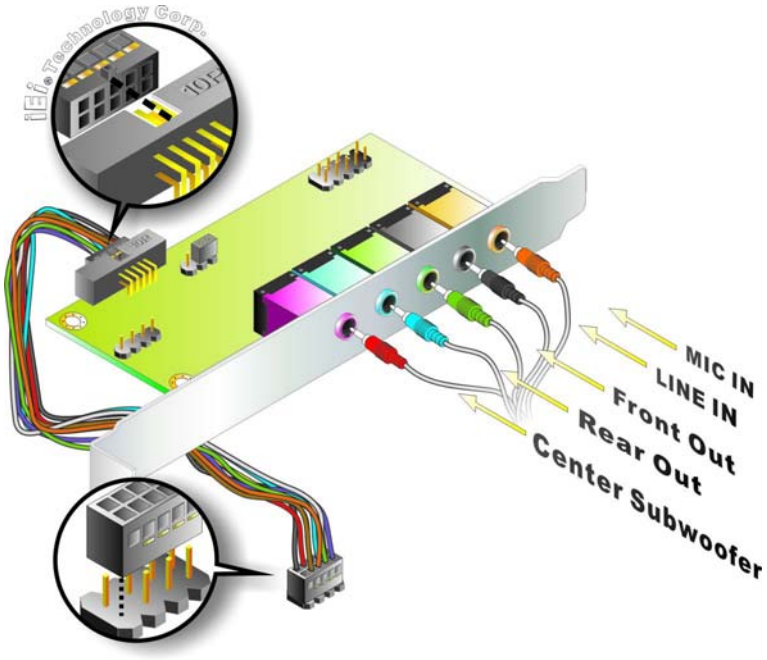


Figure 5-10: Audio Kit Connection

Step 3: **Connect the audio devices**. Connect the speakers and the subwoofer to the appropriate audio jack shown in **Figure 5-10**.

5.7.3 Keyboard/Mouse Installation

To install a keyboard or mouse, a PS/2 cable must be attached to the keyboard or mouse connector. The PCIE-9650 has an independent 5-pin keyboard connector and independent 5-pin mouse connector on board. To connect either of these connectors to a keyboard or mouse, please do the following.

Step 1: **Locate the keyboard or mouse connector**. The locations of the 5-pin keyboard connector and the 5-pin mouse connector are shown in **Chapter 3**.

Step 2: **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the cable connector. See **Figure 5-10**.

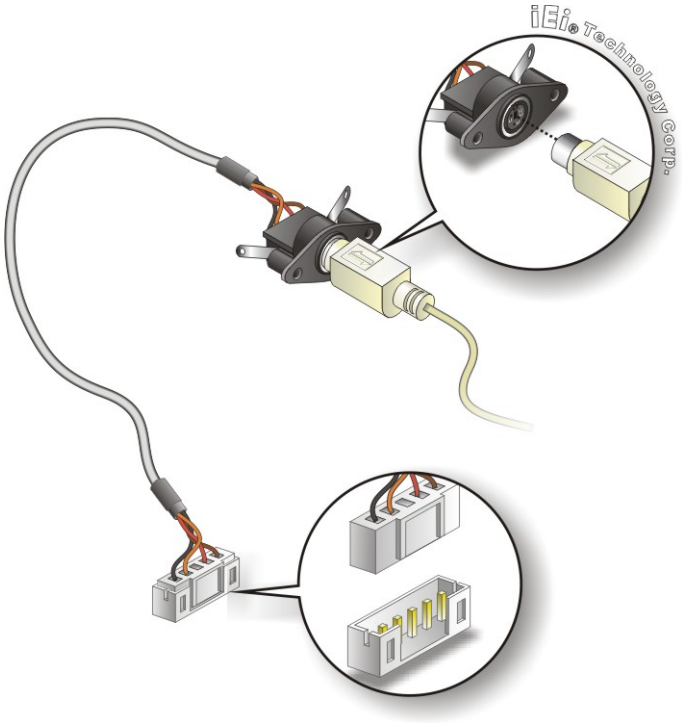


Figure 5-11: Keyboard/Mouse Connection

Step 3: **Secure the PS/2 connector to the chassis**. Use two retention screws to secure the PS/2 on the end of the cable to the chassis.

Step 4: **Connect the keyboard or mouse**. If the cable has been connected to the PCIE-9650 keyboard connector, connect a PS/2 keyboard to the PS/2 connector on the cable. If the cable has been connected to the PCIE-9650 mouse connector, connect a PS/2 mouse to the PS/2 connector on the keyboard. **Figure 5-10**.

5.7.4 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

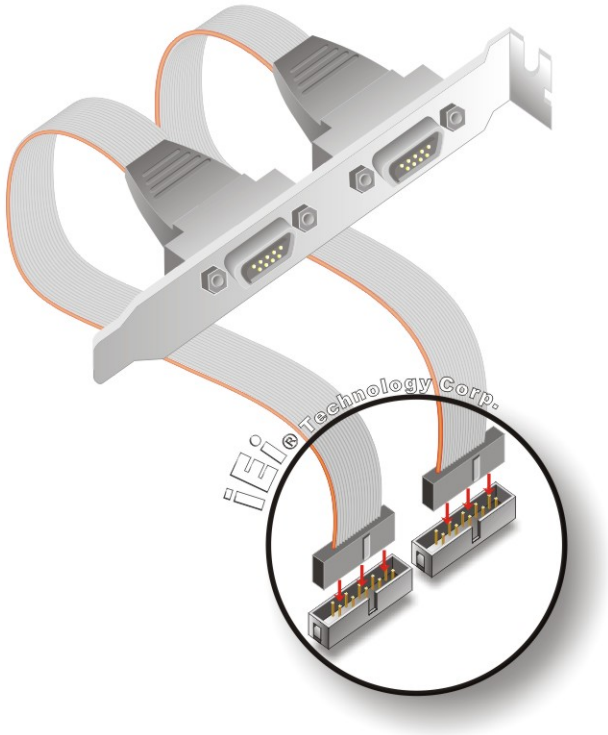


Figure 5-12: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

5.7.5 SATA Drive Connection

The PCIE-9650 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-13**.

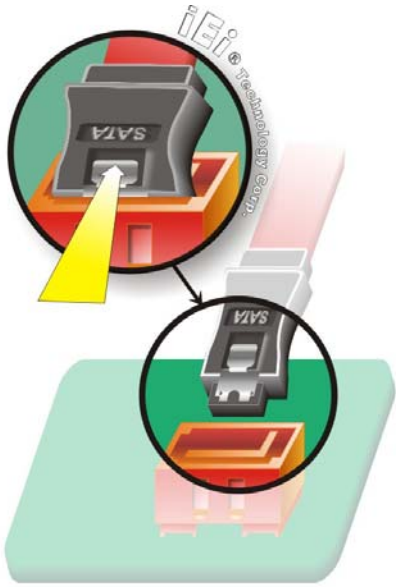


Figure 5-13: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-14**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-14**.

Figure 5-14: SATA Power Drive Connection

5.7.6 USB Cable (Dual Port)

The PCIE-9650 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the PCIE-9650 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the PCIE-9650, connect the cable connectors to the onboard connectors. See **Figure 5-15**.

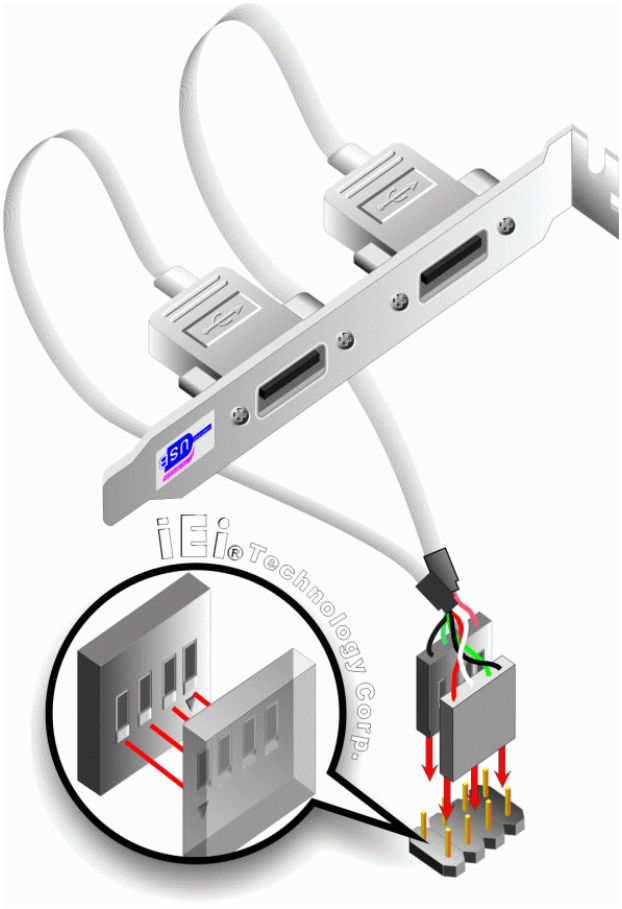


Figure 5-15: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.7.7 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the PCIE-9650, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 4**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the PCIE-9650 USB connectors.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the PCIE-9650, connect the cable connectors to the onboard connectors. See **Figure 5-15**.

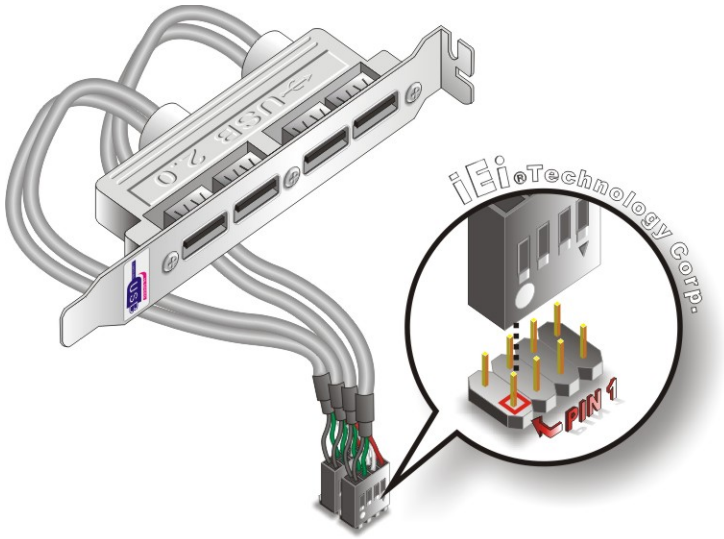


Figure 5-16: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- VGA monitors

- RJ-45 Ethernet cable connectors
- USB devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding PCIE-9650 external peripheral interface connector making sure the pins are properly aligned.

5.8.1 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the PCIE-9650. See **Figure 5-17**.

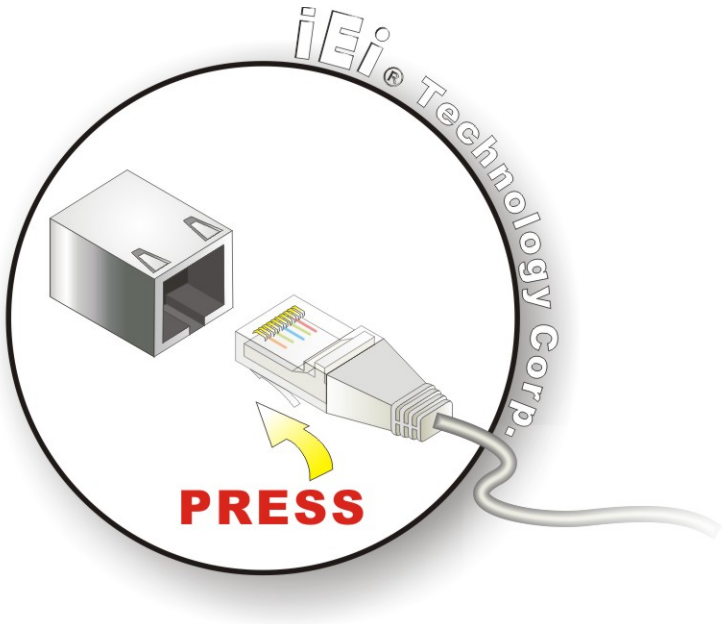


Figure 5-17: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

5.8.2 USB Device Connection (Single Connector)

There are two external USB 2.0 connectors. Both connectors are perpendicular to the PCIE-9650. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 1: **Located the USB connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the USB device connector with one of the connectors on the PCIE-9650. See **Figure 5-17**.

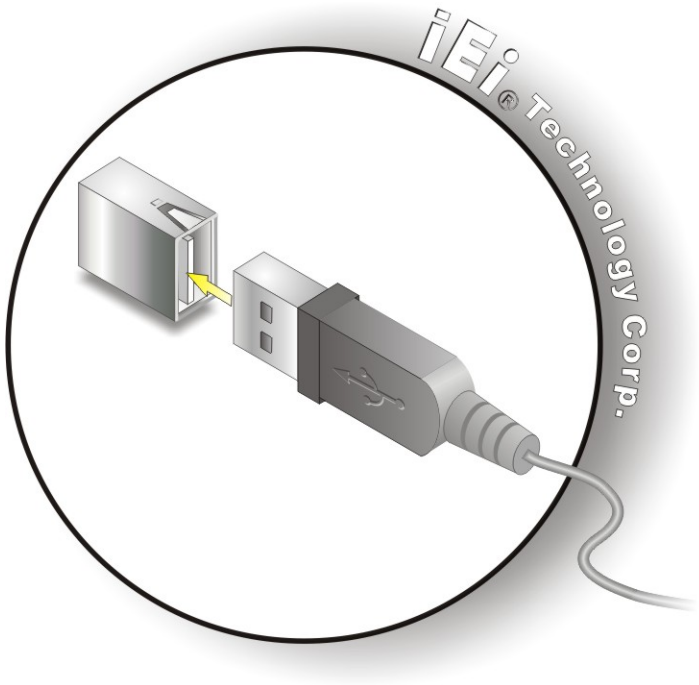


Figure 5-18: USB Device Connection

Step 3: **Insert the device connector.** Once aligned, gently insert the USB device connector into the onboard connector.

5.8.3 VGA Monitor Connection

The PCIE-9650 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the PCIE-9650, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the PCIE-9650.

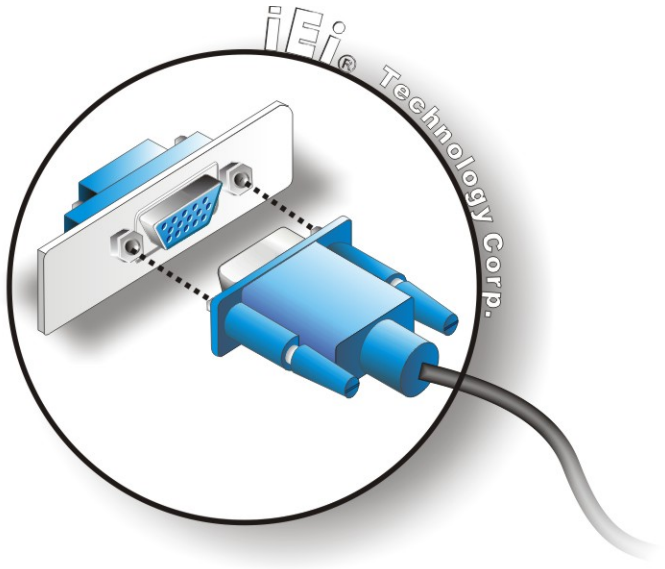


Figure 5-19: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

Chapter

6

BIOS Setup

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen. 0.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **Chapter 5**, **Section 5.5.1**.

6.1.5 BIOS Menu Bar

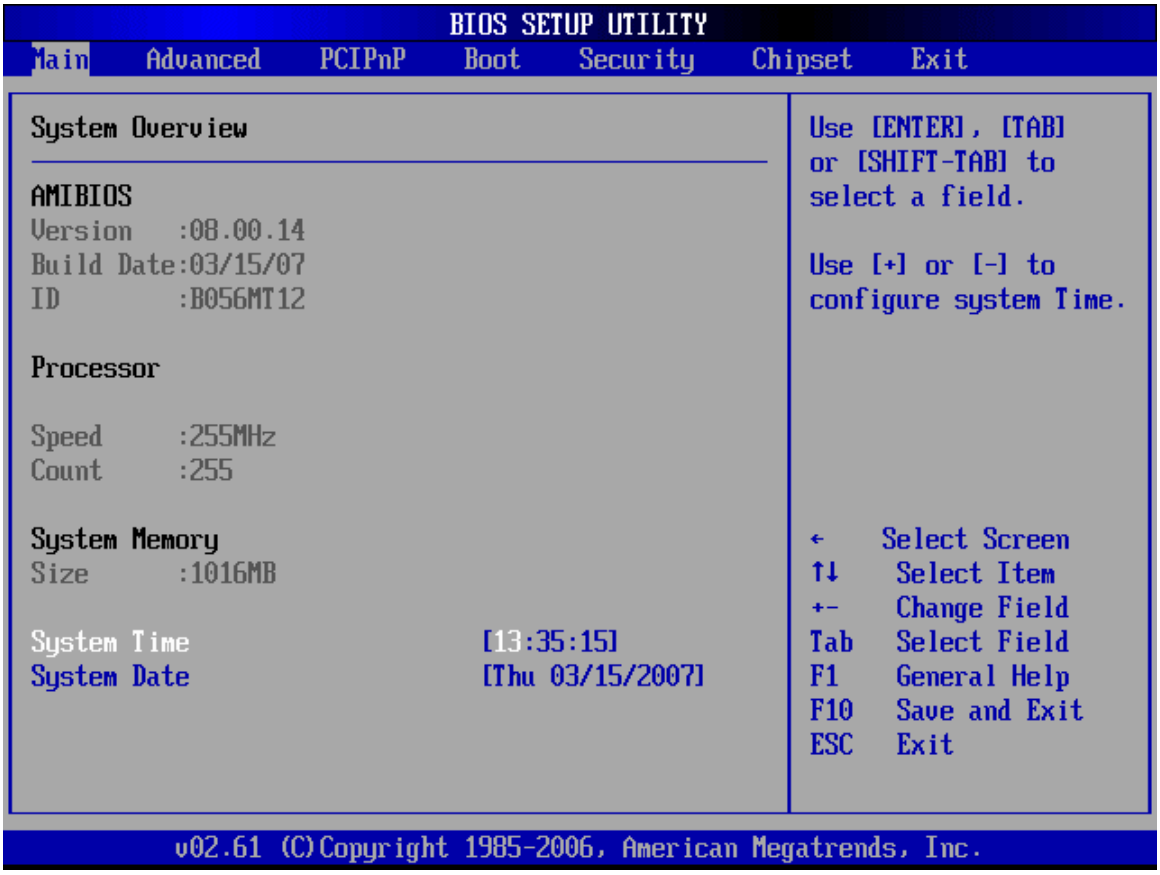
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications

- **Type**: Names the currently installed processor
- **Speed**: Lists the processor speed
- **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

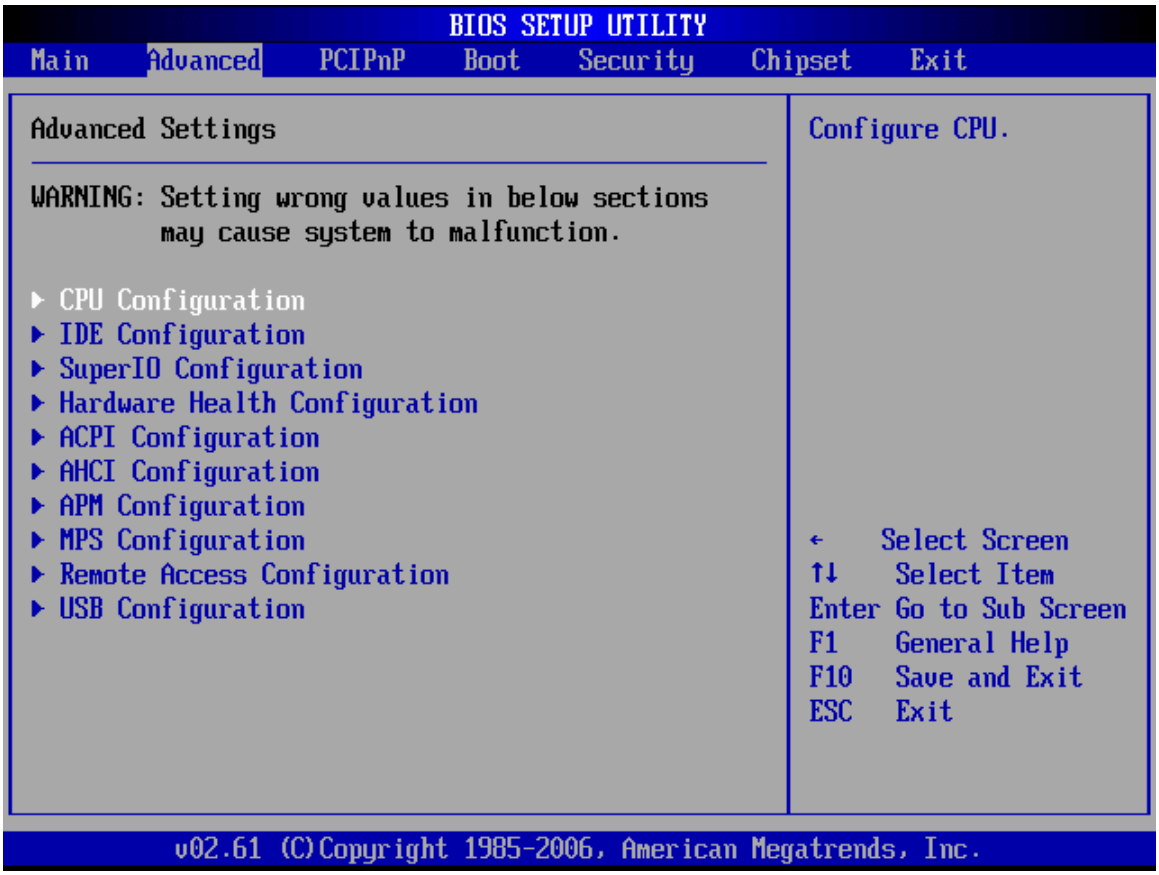
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- CPU Configuration 92
- IDE Configuration 93
- Super IO Configuration 95
- Hardware Health Configuration 98
- ACPI Configuration 100
- AHCI Configuration 103
- APM Configuration 103
- MPS Configuration 105

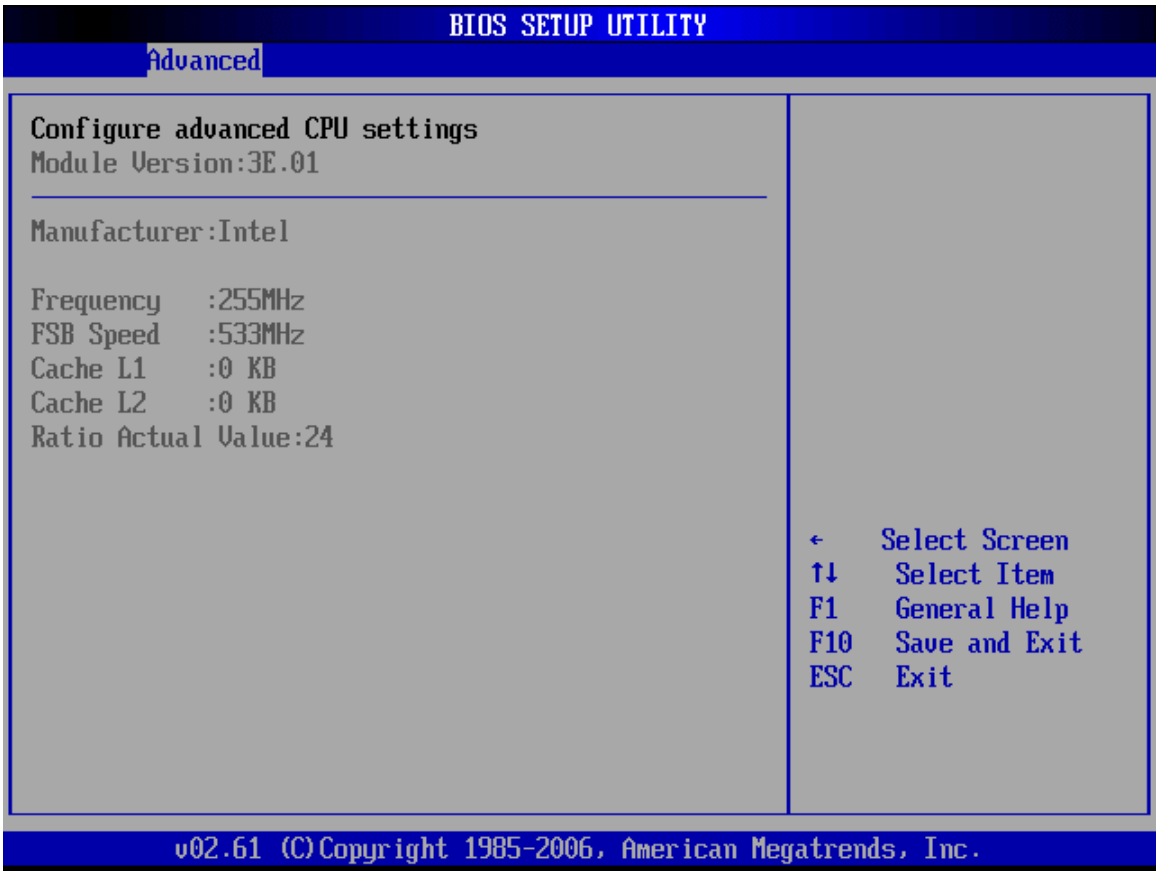
- Remote Access Configuration..... 106
- USB Configuration 110



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.



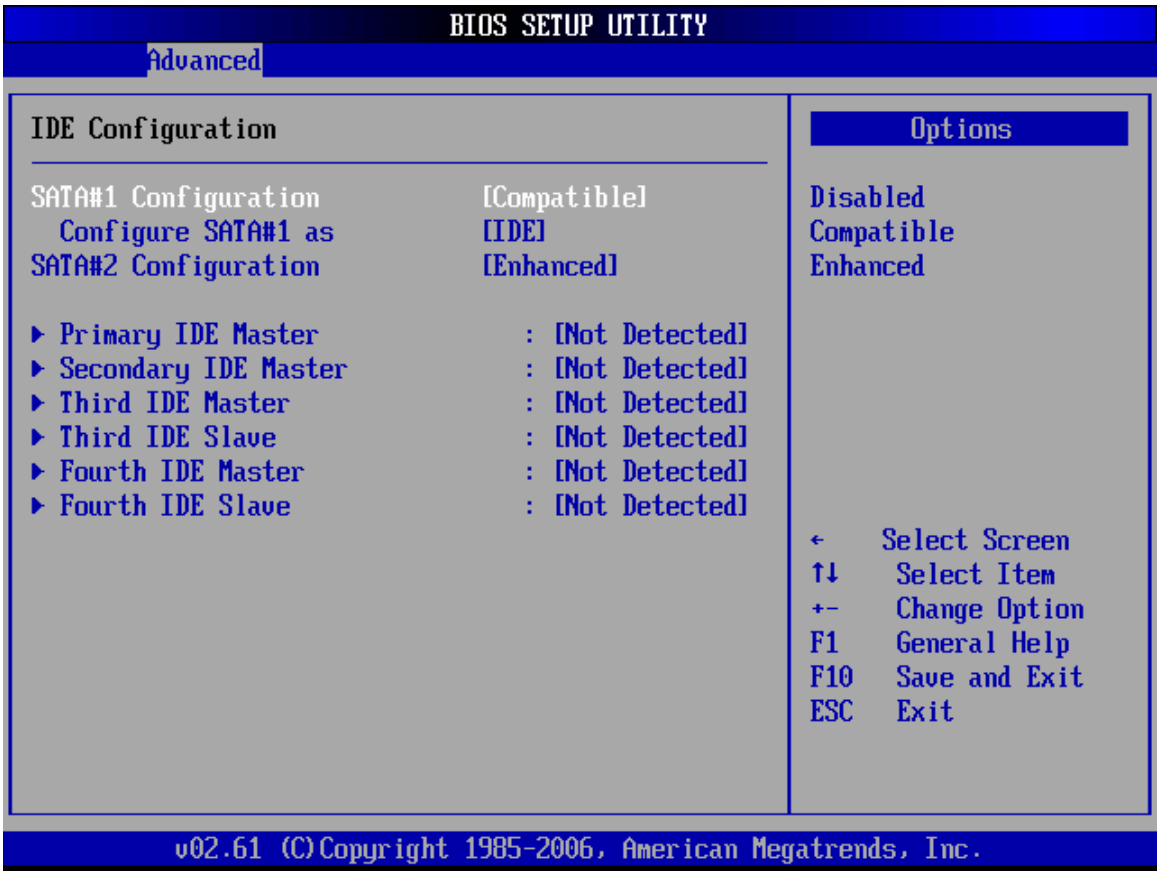
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- Ratio Actual Value:

6.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **SATA#1 Configuration**

Use the **SATA#1 Configuration** BIOS option to select the configuration mode or disable the SATA 1 drive.

➔ **Disabled**		SATA 1 drive is disabled
➔ **Compatible**	(Default)	SATA 1 drive is in compatible mode
➔ **Enhanced**		SATA 1 drive is in enhanced mode

➔ **Configure SATA#1 as [IDE]**

Use the **Configure SATA#1 as** BIOS option to select the mode for the SATA 1 drive.

➔ **IDE**	(Default)	SATA 1 is configured as an IDE device

- ➔ **RAID** SATA 1 is configured as an RAID element
- ➔ **AHCI** SATA 1 is configured as an AHCI device

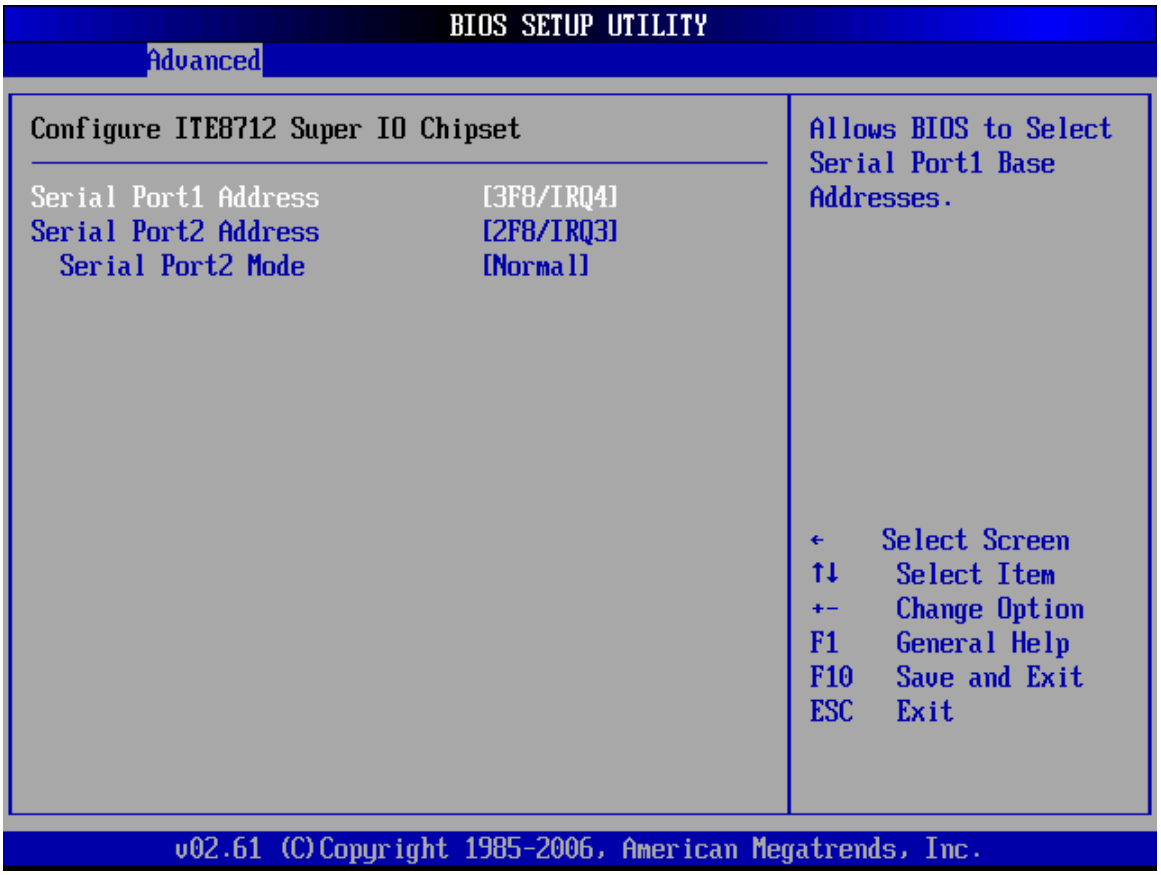
➔ **SATA#2 Compatible**

Use the **SATA#2 Compatible** BIOS option to select the configuration mode or disable the SATA 2 drive.

- ➔ **Disabled** SATA 1 drive is disabled
- ➔ **Enhanced** (Default) SATA 1 drive is in enhanced mode

6.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 5**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 5: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA
➔ **ASK IR**		Serial Port 2 mode is ASK IR

➔ **Parallel Port Address [Disabled]**

Use the **Parallel Port Address** option to select the parallel port base address.

➔ **Disabled**	**DEFAULT**	No base address is assigned to the Parallel Port
➔ **378**		Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

➔ **Normal**	**DEFAULT**	The normal parallel port mode is the standard mode for parallel port operation.

➔ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.

➔ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

EPP+ECP The parallel port is also be compatible with ECP and EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

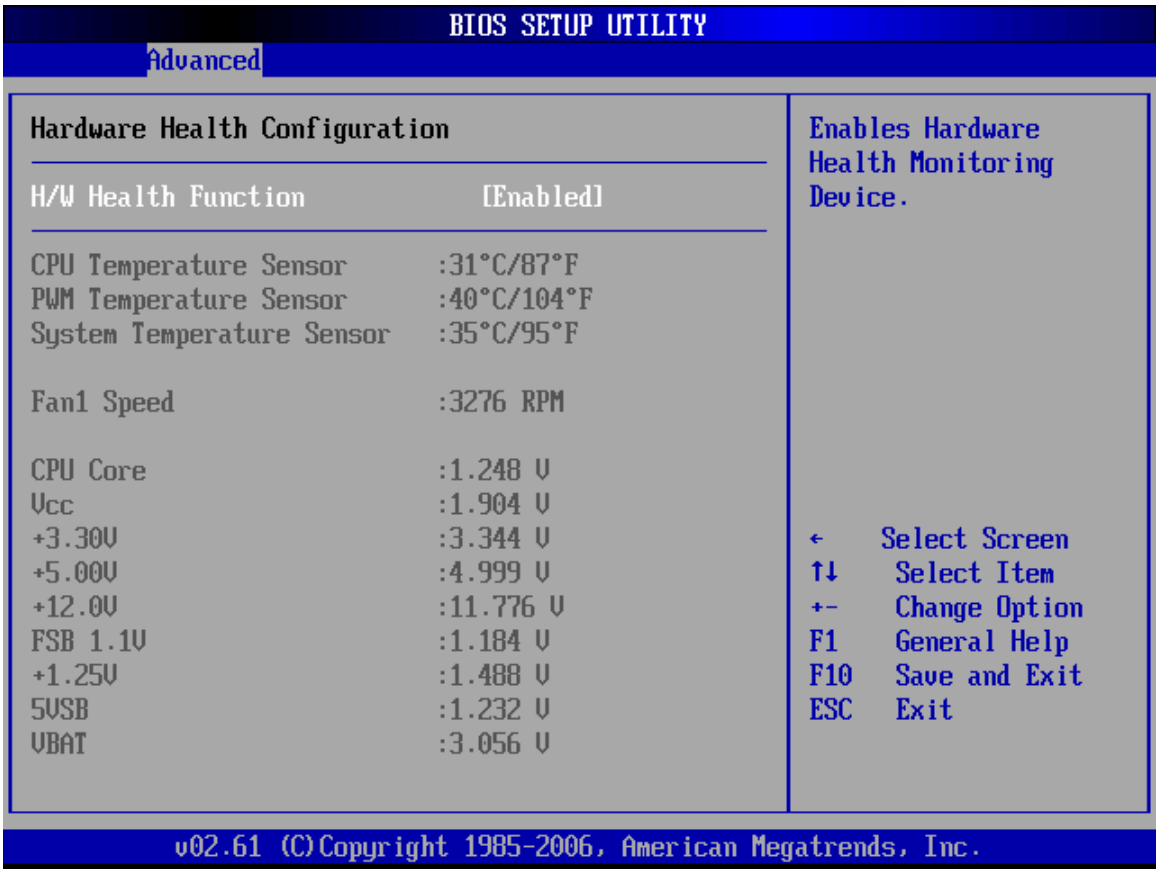
Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address

➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

6.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 6**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 6: Hardware Health Configuration

➔ **H/W Health Function [Enabled]**

Use the **H/W Health Function** to enable the monitoring of the system environmental parameters.

➔ **Disabled** Disables the health monitoring function

➔ **Enabled** (Default) Enables the health monitoring function

When enabled, the following system parameters and values are shown. The system parameters that are monitored are:

The following system parameters and values are shown. The system parameters that are monitored are:

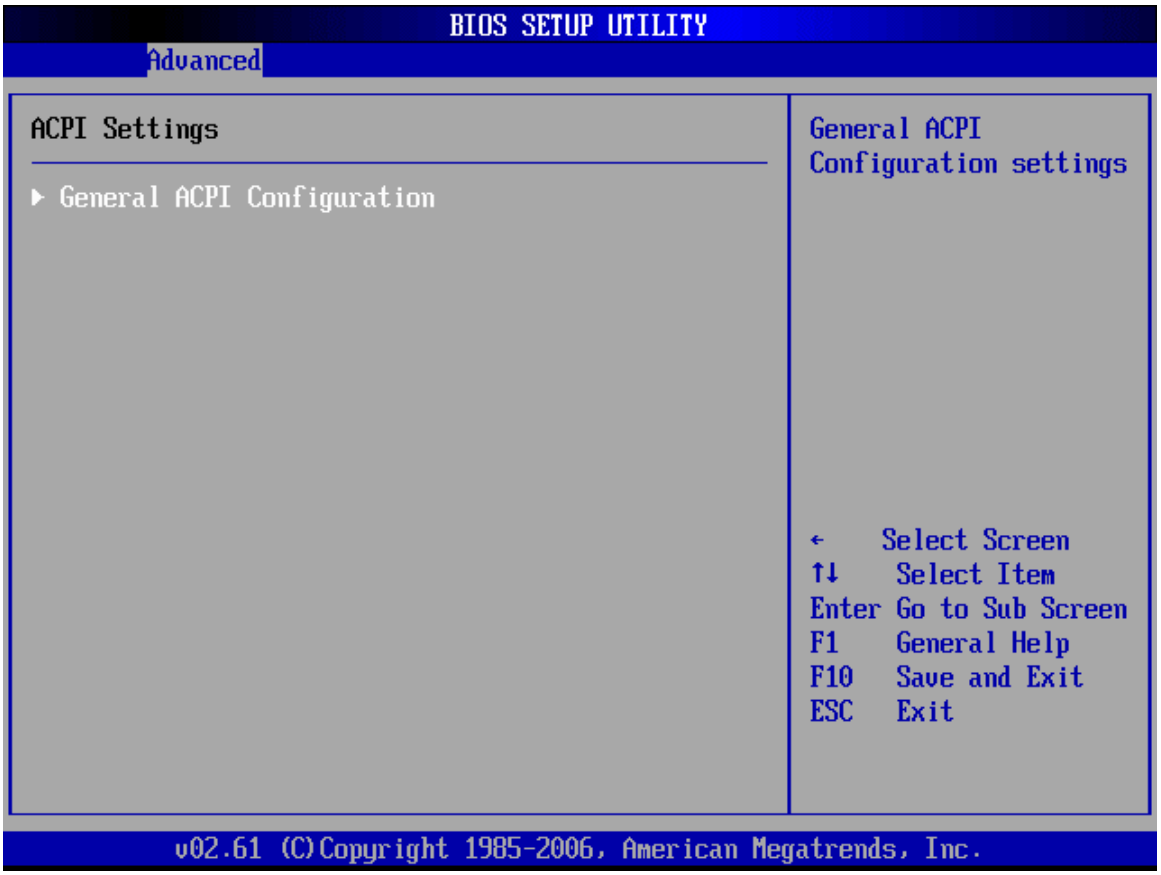
- **System Temperatures**: The following system temperatures are monitored

- CPU Temperature
- PWM Temperature
- System Temperature

- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - Vcc
  - +3.30V
  - +5.00V
  - +12.0V
  - FSB 1.1V
  - 1.25V
  - 5VSB
  - VBAT

6.3.5 ACPI Configuration

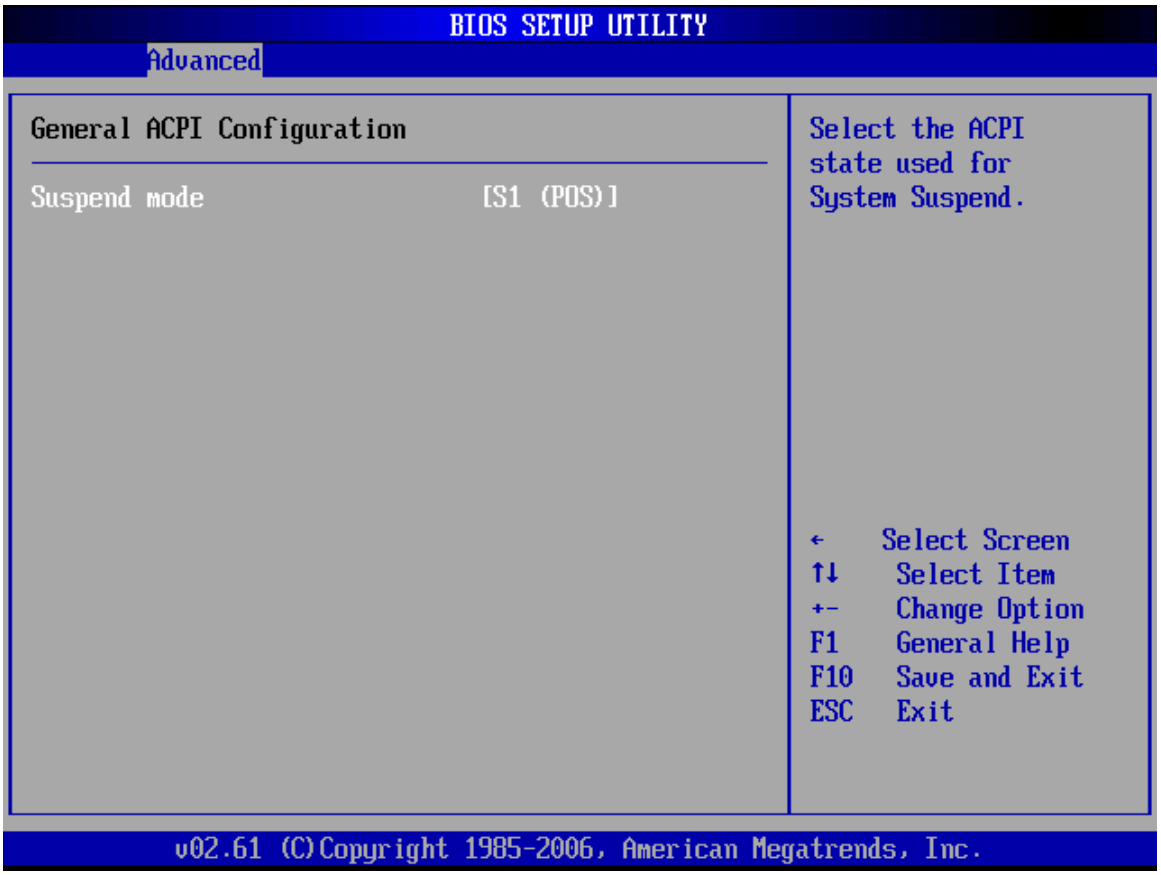
The **ACPI Configuration** menu (**BIOS Menu 7**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 7: ACPI Configuration

6.3.5.1 General ACPI Configuration

Use the General ACPI Configuration menu (BIOS Menu 8) to select the ACPI state when the system is suspended.



BIOS Menu 8: General ACPI Configuration [Advanced\ ACPI Configuration]

➔ **Suspend Mode [S1(POS)]**

The **Suspend Mode** BIOS option specifies the sleep state your system will enter when it is not being used.

➔ **S1 (POS)** (Default) System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

➔ **Auto** The system automatically determines the system sleep state.

6.3.6 AHCI Configuration

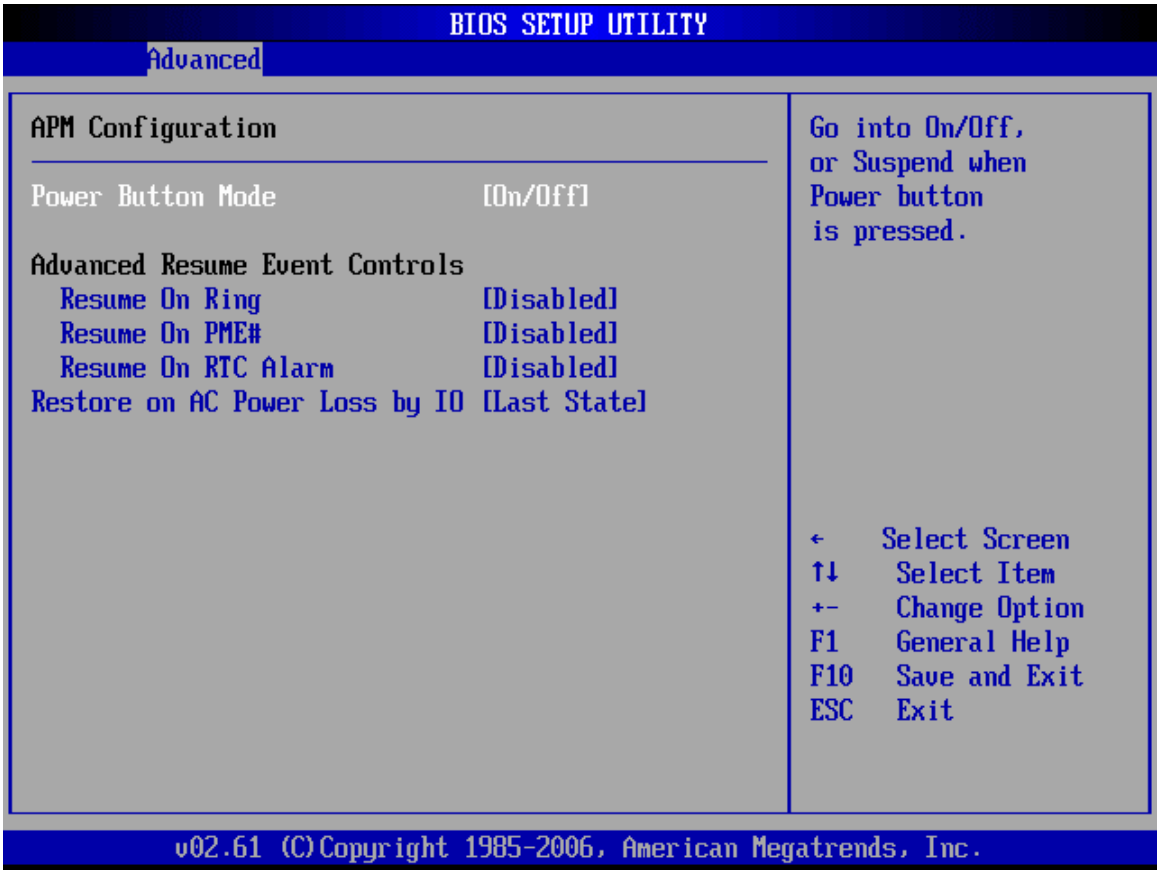
The **AHCI Settings** menu reports on the auto-detection of IDE devices connected to the system.

➔ **AHCI Port n [Not Detected]**

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected by the system. This option displays the status of the auto detection of IDE devices.

6.3.7 APM Configuration

The APM Configuration menu (BIOS Menu 9) allows the advanced power management options to be configured.


BIOS SETUP UTILITY
Advanced
APM Configuration
Power Button Mode [On/Off]
Advanced Resume Event Controls
Resume On Ring [Disabled]
Resume On PME# [Disabled]
Resume On RTC Alarm [Disabled]
Restore on AC Power Loss by IO [Last State]
Go into On/Off, or Suspend when Power button is pressed.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 9:Advanced Power Management Configuration

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off**	(Default)	When the power button is pressed the system is either turned on or off
➔ **Suspend**		When the power button is pressed the system goes into suspend mode

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled**	(Default)	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

➔ **Resume on PME# [Disabled]**

Use the **Resume on PME#** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

➔ **Disabled**	(Default)	Wake event not generated by PCI PME controller activity
➔ **Enabled**		Wake event generated by PCI PME controller activity

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** to specify when the computer is roused from a suspended state.

➔ **Disabled**	(Default)	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following will appear with values that can be selected:

➔ **RTC Alarm Date (Days)**

➔ **System Time**

After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

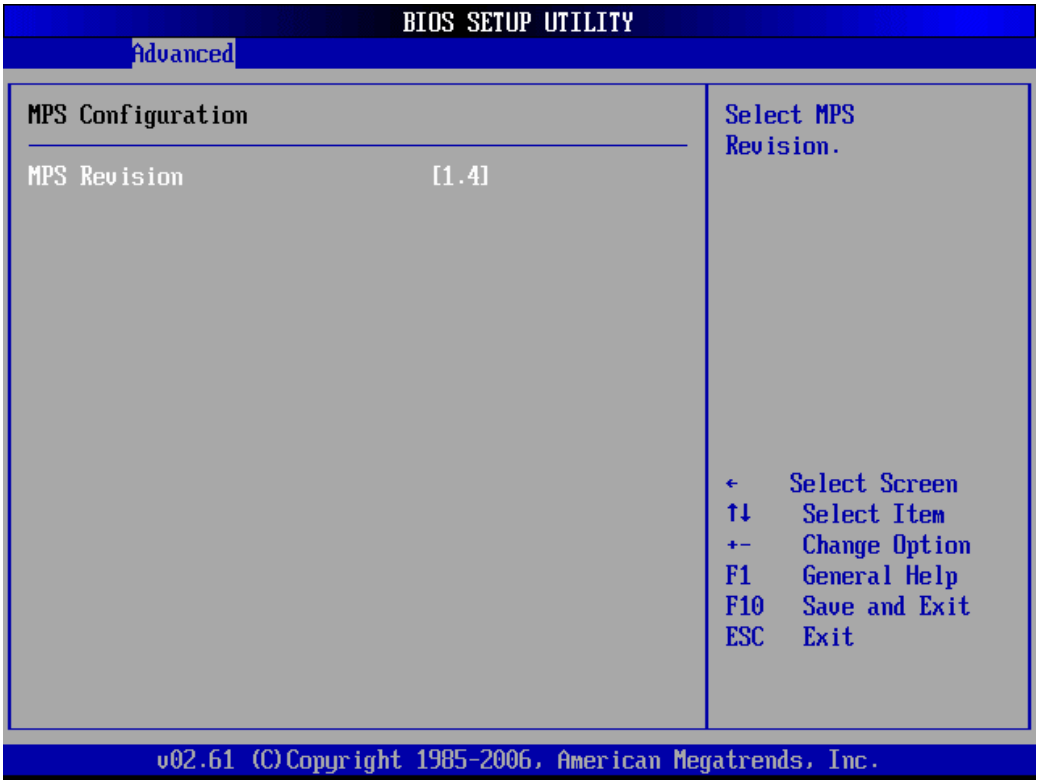
➔ **Restore on AC Power Loss by IO [Power Off]**

Use the **Restore on AC Power Loss by IO** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**	(Default)	The system turns on
➔ **Last State**		The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

6.3.8 MPS Configuration

Use the MPS Configuration menu (BIOS Menu 10) to select the multi-processor table.



BIOS Menu 10: MPS Configuration

➔ **MPS Revision [1.1]**

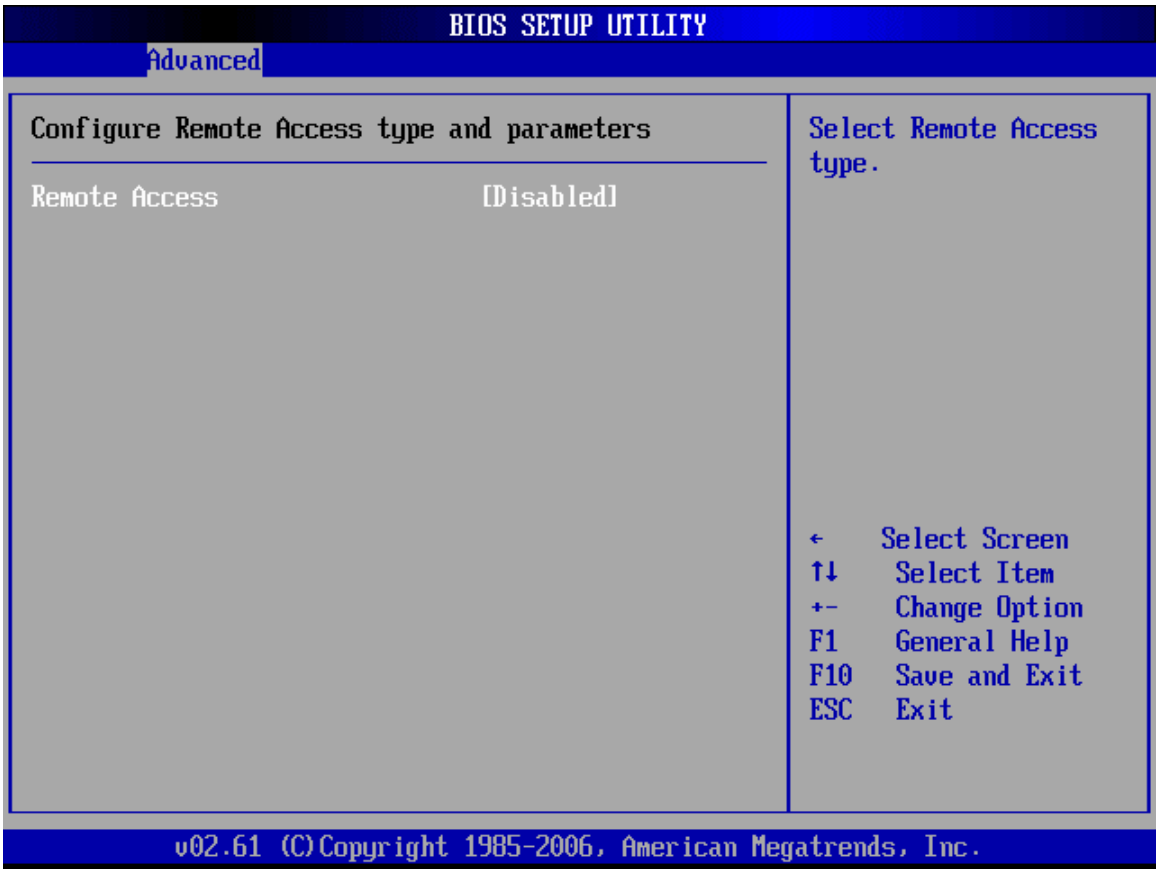
Use the **Multiprocessor Specification (MPS) for OS** option to specify the MPS version to be used.

➔ **1.1** MPS version 1.1 is used

➔ **1.4 DEFAULT** MPS version 1.4 is used

6.3.9 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**

➔ **Redirection after BIOS POST**

➔ **Terminal Type**

➔ **VT-UTF8 Combo Key Support**

➔ **Sredir Memory Display Delay**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1**	**DEFAULT**	System is remotely accessed through COM1
➔ **COM2**		System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

➔ **None**	**DEFAULT**	No control flow,
➔ **Hardware**		Hardware is set as the console redirection
➔ **Software**		Software is set as the console redirection

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

➔ **VT-UTF8 Combo Key Support [Disabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled**	**DEFAULT**	Disables the VT-UTF8 terminal keys
➔ **Enabled**		Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

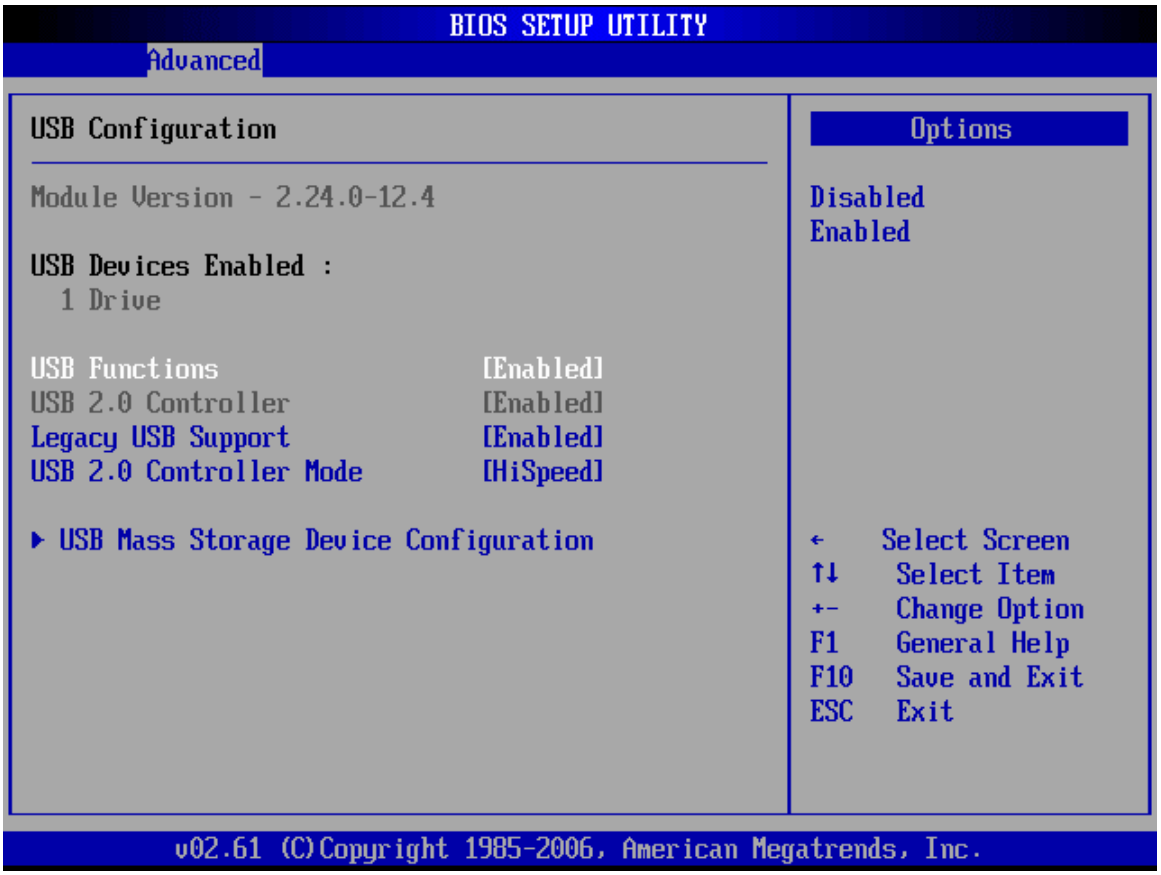
➔ **Sredir Memory Display Delay [Disabled]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay **DEFAULT**
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

6.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

➔ **USB Functions [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled**		USB function support disabled
➔ **Enabled**	**DEFAULT**	USB function support enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

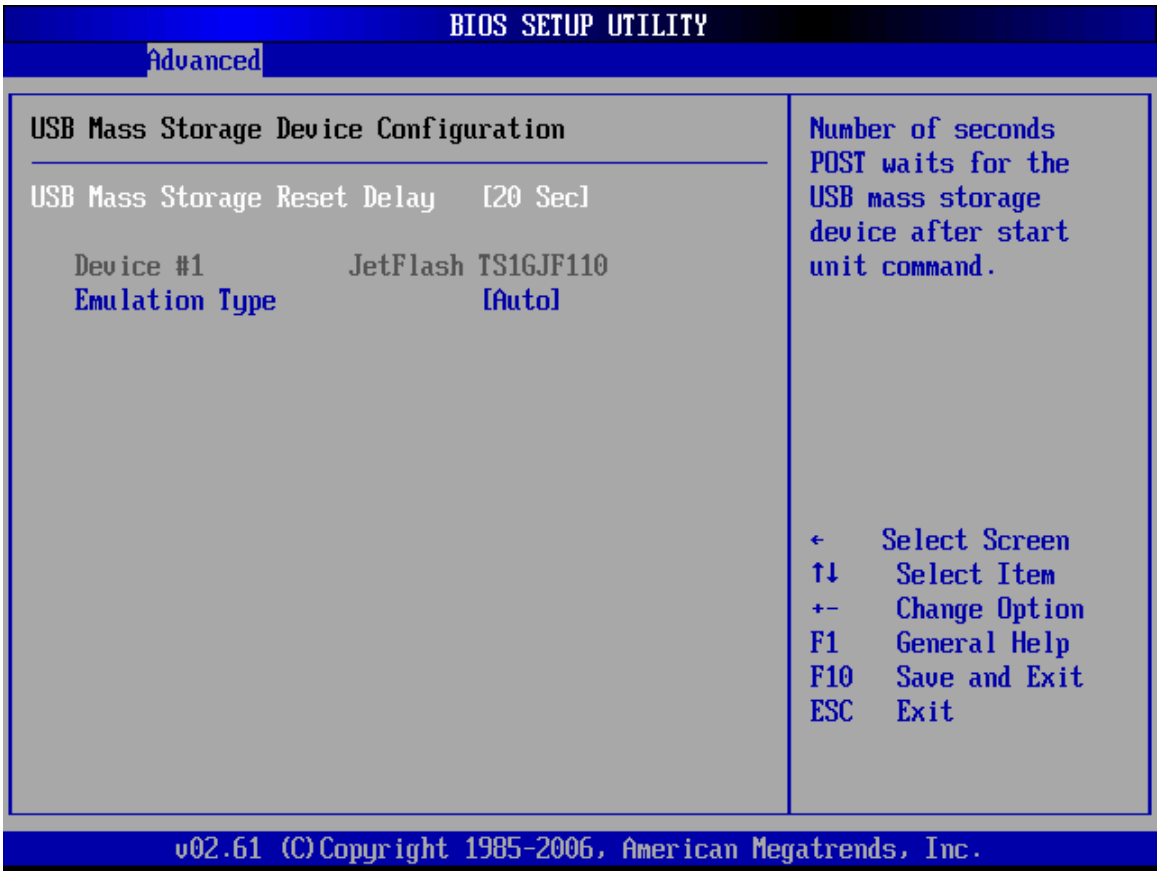
➔ **FullSpeed**		The controller is capable of operating at 12Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at 480Mb/s

6.3.10.1 USB Mass Storage Device Configuration

NOTE:

This option is only available if a USB drive is inserted into the USB port.

Use the USB Mass Storage Device Configuration menu (BIOS Menu 13) to configure USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 JetFlash TS1GJF110
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 13: USB Mass Storage Device Configuration

➔ **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

➔ **10 Sec**		POST waits 10 seconds for the USB mass storage device after the start unit command.
➔ **20 Sec**	**DEFAULT**	POST waits 20 seconds for the USB mass storage device after the start unit command.
➔ **30 Sec**		POST waits 30 seconds for the USB mass storage device after the start unit command.
➔ **40 Sec**		POST waits 40 seconds for the USB mass storage device after the start unit command.

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

➔ **Auto**	**DEFAULT**	BIOS auto-detects the current USB.
➔ **Floppy**		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
➔ **Forced FDD**		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
➔ **Hard Disk**		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
➔ **CDROM**		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this

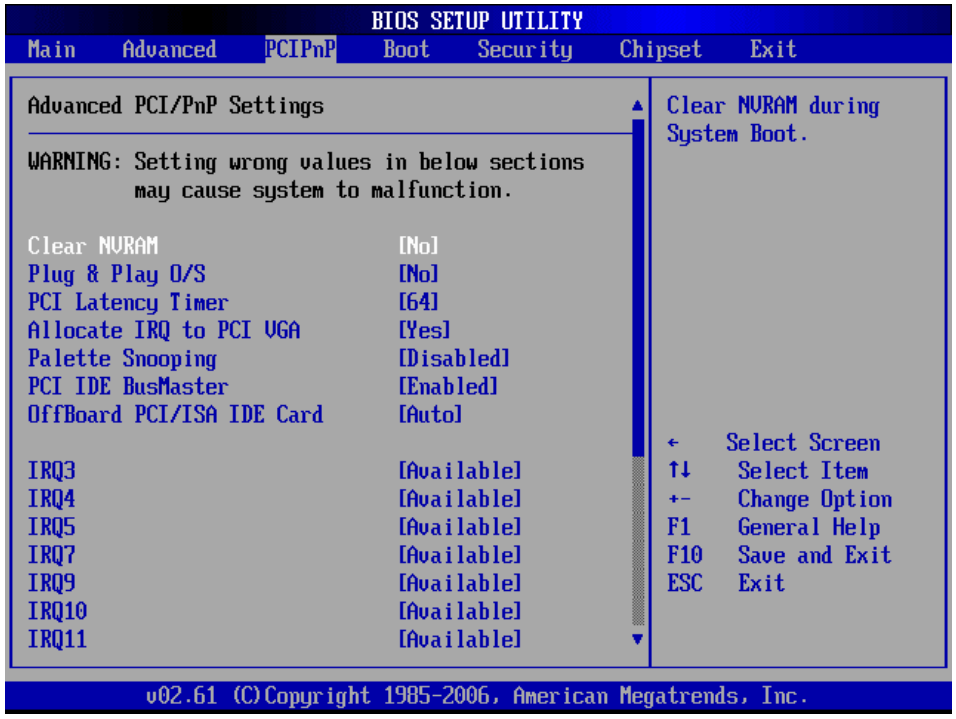
option.

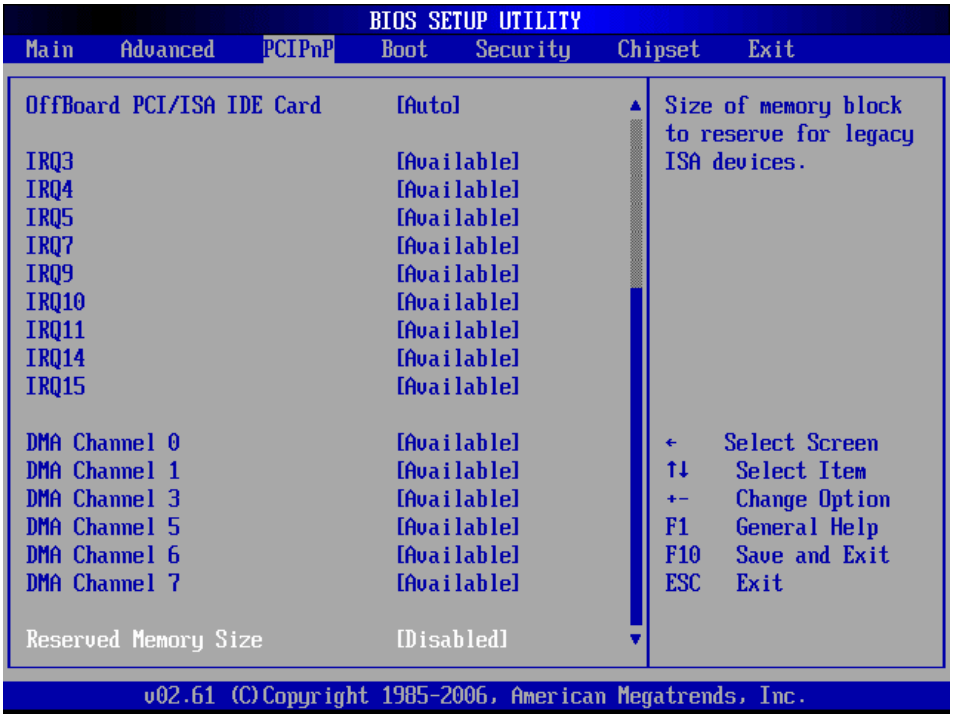
6.4 PCI/PnP

Use the PCI/PnP menu (BIOS Menu 14) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.





BIOS Menu 14: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No** **DEFAULT** System does not clear NVRAM during system boot

➔ **Yes** System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No** **DEFAULT** If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system

is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 Default
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes** (Default) Assigns an IRQ to a PCI VGA card if card requests IRQ

➔ **No** Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled DEFAULT** Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.

➔ **No/Enabled** PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The

graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled**	**DEFAULT**	Busmastering is prevented
➔ **No/Enabled**		IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the OffBoard PCI/ISA IDE Card BIOS option to select the OffBoard PCI/ISA IDE Card.

➔ **Auto**	**DEFAULT**	The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.
➔ **PCI Slot 1**		PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.
➔ **PCI Slot 2**		PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.
➔ **PCI Slot 3**		PCI Slot 3 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.
➔ **PCI Slot 4**		PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.
➔ **PCI Slot 5**		PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6** PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

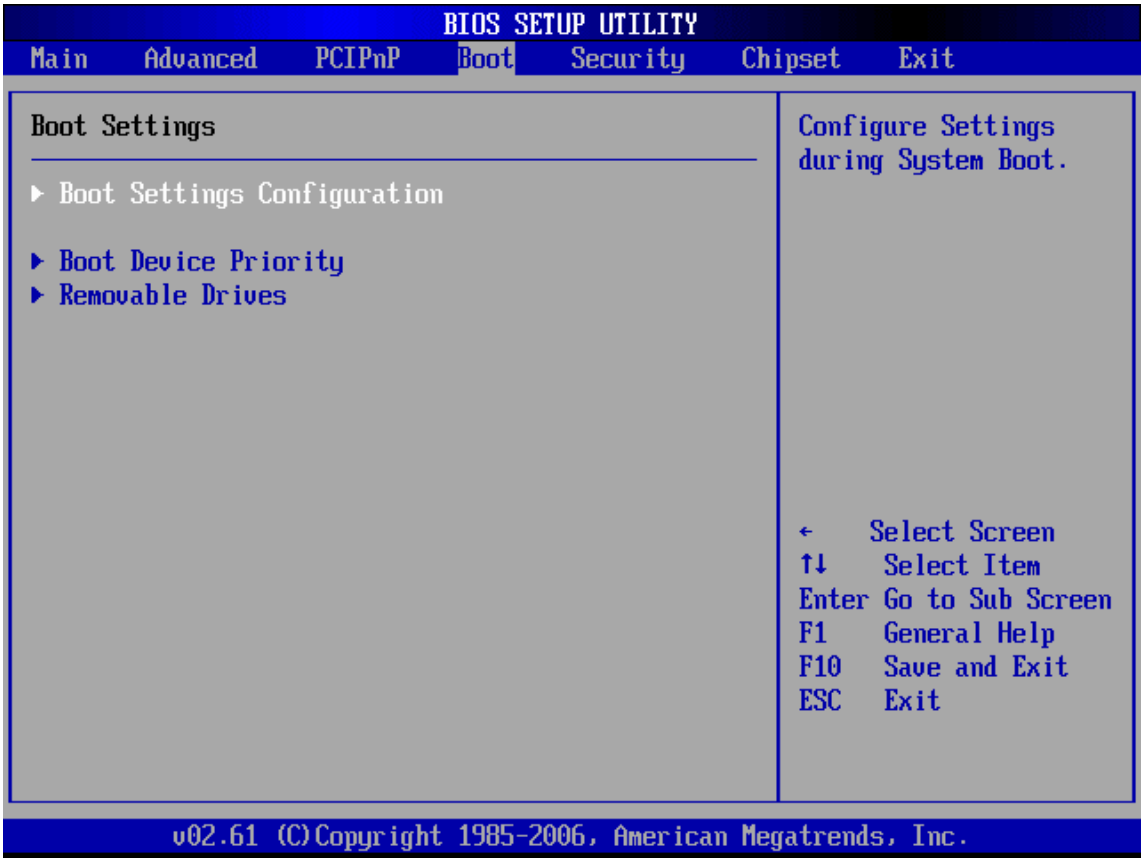
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16KB reserved for legacy ISA devices
➔	**32K**		32KB reserved for legacy ISA devices
➔	**64K**		54KB reserved for legacy ISA devices

6.5 Boot

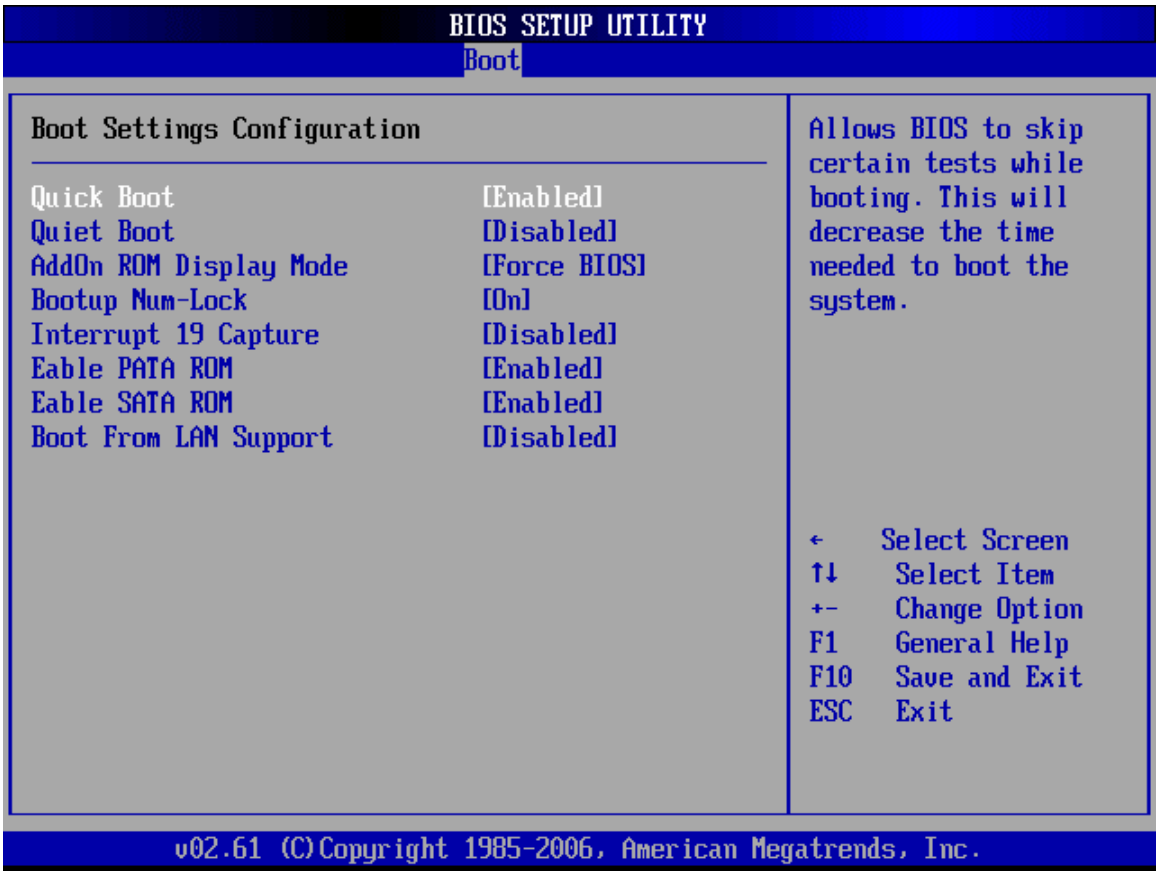
Use the Boot menu (BIOS Menu 15) to configure system boot options.



BIOS Menu 15: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (BIOS Menu 15) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Interrupt 19 Capture [Disabled]
Eable PATA ROM [Enabled]
Eable SATA ROM [Enabled]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 16: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Interrupt 19 Capture [Disabled]**

Use the **Interrupt 19 Capture** option to allow optional ROMs such as network controllers to trap BIOS interrupt 19.

➔ **Disabled**	**DEFAULT**	Does not allow optional ROM to trap interrupt 19
➔ **Enabled**		Allows optional ROM to trap interrupt 19

➔ **Enable SATA ROM**

Use the **Enable SATA ROM** option to initiate the ROM dedicated to the SATA drive data..

➔ **Disabled**	**DEFAULT**	SATA drive ROM not initiated
➔ **Enabled**		SATA drive ROM is initiated

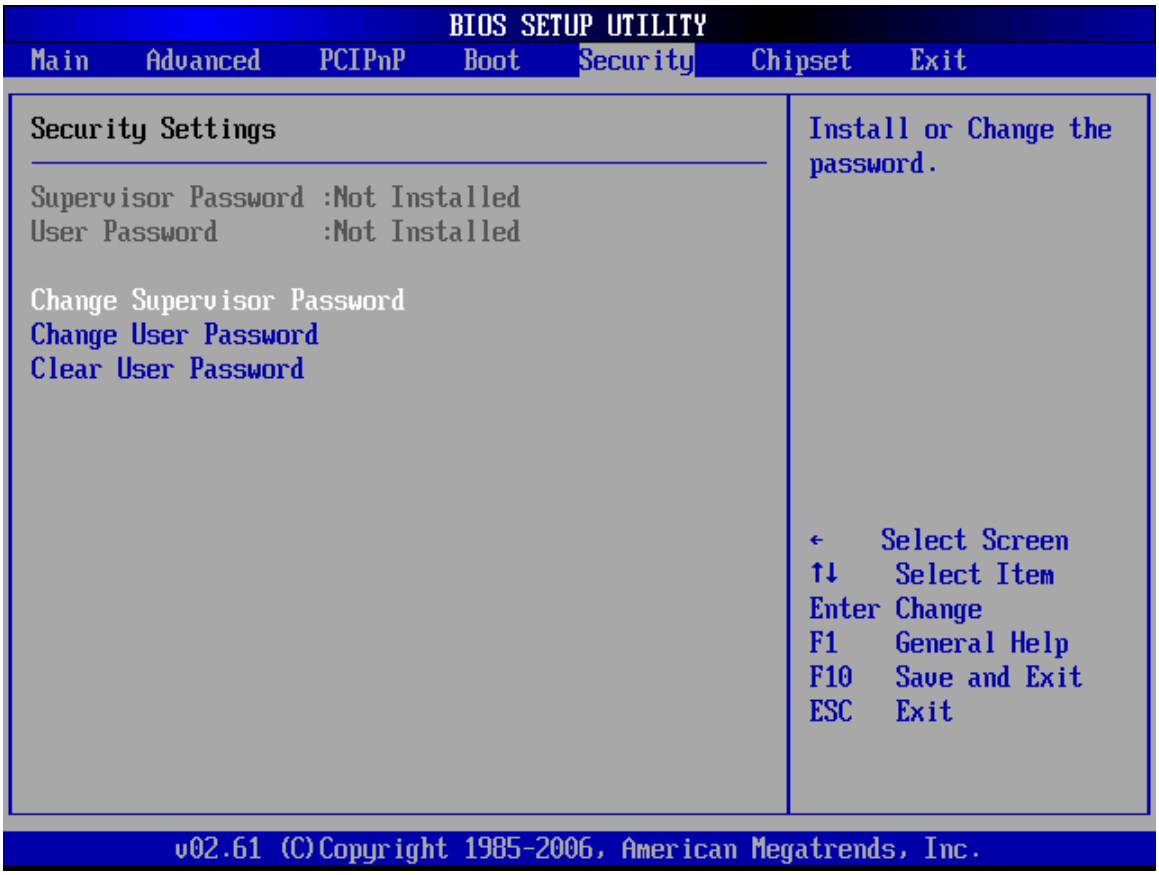
➔ **Boot From LAN Support [Disabled]**

Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

➔ **Disabled**	(Default)	Cannot be booted from a remote system through the LAN
➔ **Enabled**	(Default)	Can be booted from a remote system through the LAN

6.6 Security

Use the Security menu (BIOS Menu 17) to set system and user passwords.



BIOS Menu 17: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

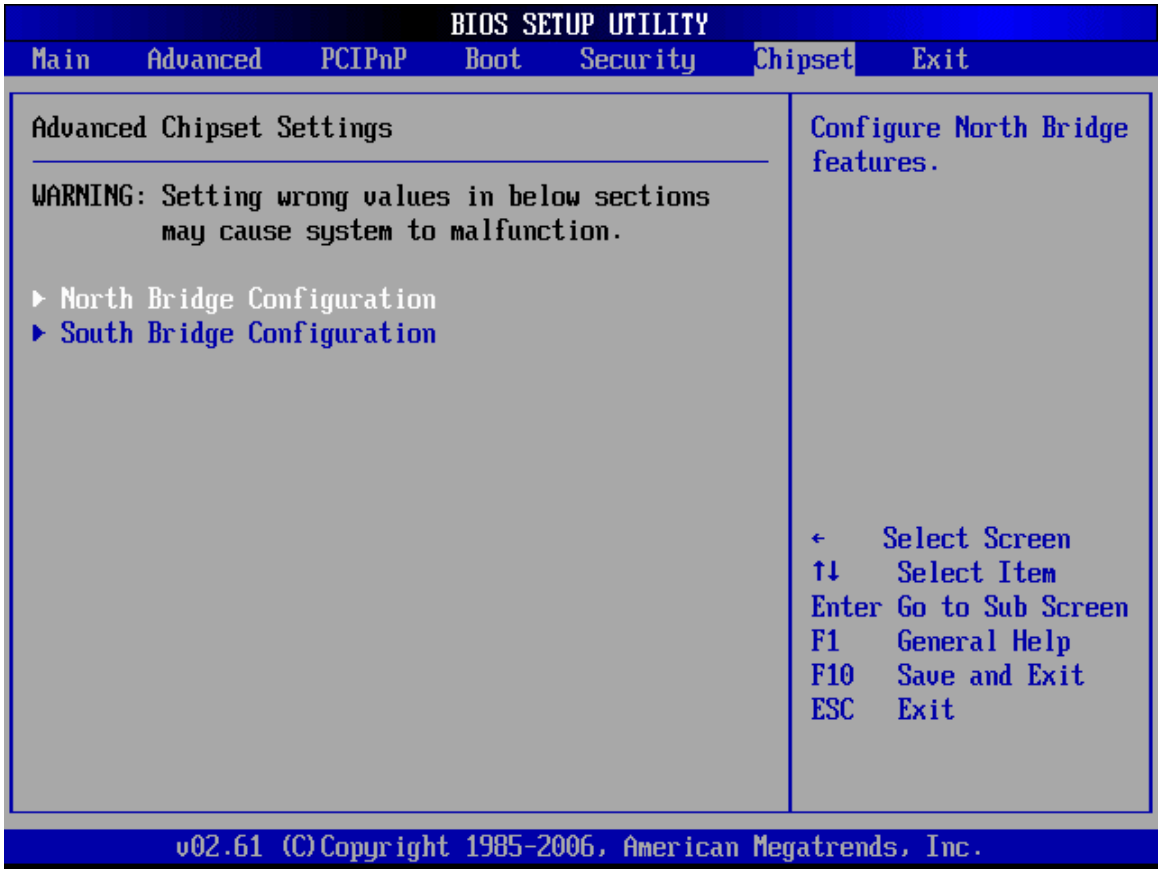
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the NorthBridge and SouthBridge configuration menus

WARNING!

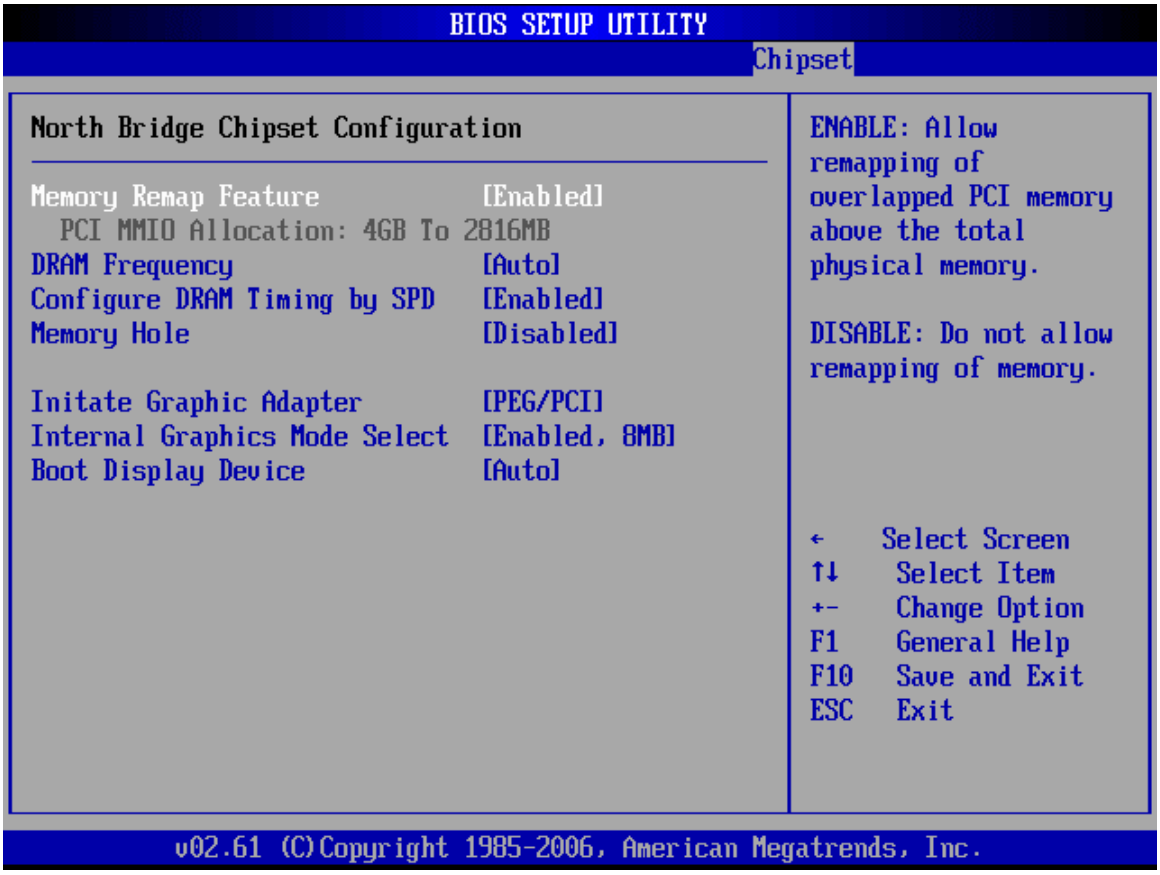
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
North Bridge Configuration
South Bridge Configuration
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

BIOS Menu 18: Chipset

6.7.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (BIOS Menu 18) to configure the northbridge chipset.


BIOS SETUP UTILITY
Chipset
North Bridge Chipset Configuration
Memory Remap Feature [Enabled]
PCI MMIO Allocation: 4GB To 2816MB
DRAM Frequency [Auto]
Configure DRAM Timing by SPD [Enabled]
Memory Hole [Disabled]
Initate Graphic Adapter [PEG/PCI]
Internal Graphics Mode Select [Enabled, 8MB]
Boot Display Device [Auto]
ENABLE: Allow remapping of overlapped PCI memory above the total physical memory.
DISABLE: Do not allow remapping of memory.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

BIOS Menu 19:NorthBridge Chipset Configuration

➔ **Memory Remap Feature [Enabled]**

Use the **Primary Graphics Adapter** option to allow the system to re-map the PCI memory overlapped above the total physical memory.

➔ **Disabled** Memory re-mapping not allowed.

➔ **Enabled** **DEFAULT** Memory re-mapping allowed.

➔ **DRAM Frequency [Auto]**

Use the **DRAM Frequency** option to specify the DRAM frequency or allow the system to automatically detect the DRAM frequency.

➔ **533MHz**		Sets the DRAM frequency to 533MHz
➔ **667MHz**		Sets the DRAM frequency to 667MHz
➔ **800MHz**		Sets the DRAM frequency to 800MHz
➔ **Auto**	**DEFAULT**	Automatically selects the DRAM frequency

➔ **Configure DRAM Timing by SPD [Enabled]**

Use the **Configure DRAM Timing by SPD** option to determine if the system uses the SPD (Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications including the speed of the individual components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

➔ **Disabled**		DRAM timing parameters are manually set using the DRAM sub-items
➔ **Enabled**	**DEFAULT**	DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD)

If the **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [5]
- DRAM RAS# to CAS# Delay [6 DRAM Clocks]
- DRAM RAS# Precharge [5 DRAM Clocks]
- DRAM RAS# Activate to Precha [15 DRAM Clocks]

➔ **DRAM CAS# Latency [5]**

Use the **CAS Latency Time** configuration option to set the Column Address Strobe (CAS) delay time. (To be able to change this configuration option the **DRAM Latency Timing**

configuration option must be set to "**Manual**") The following configuration options are available

- 6 nanoseconds **DEFAULT**
- 5 nanoseconds
- 4 nanoseconds
- 3 nanoseconds

➔ **DRAM RAS# to CAS# Delay [5 DRAM Clocks]**

Use the **DRAM RAS# to CAS# Delay** option to specify the number of clock cycles must elapse between sending a RAS (row address strobe) signal and the CAS (column address strobe) signal. A pause is required between the RAS signal and the CAS signal to ensure the memory is correctly addressed. (To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**") Configuration options are listed below:

- 2 DRAM Clocks
- 3 DRAM Clocks
- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks **DEFAULT**

➔ **DRAM RAS# Precharge [6 DRAM Clocks]**

Use the **DRAM RAS# Precharge** option to set the speed at which the RAM terminates the access of one row and start accessing another. (To be able to change this configuration option the **DRAM RAS# Precharge** configuration option must be set to "**Manual**") The following configuration options are available

- 2 DRAM Clocks
- 3 DRAM Clocks
- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks **DEFAULT**

➔ **DRAM RAS# Activate to Precha [15 DRAM Clocks]**

Use the **DRAM RAS# Activate to Precha** option to specify the length of the delay between the activation and precharge commands for the RAS signal. That is how long after activation can the access cycle be started again. This influences row activation time that is considered when memory has hit the last column in a specific row, or when an entirely different memory location is requested. (To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**") The following configuration options are available:

- 9 DRAM Clocks
- 10 DRAM Clocks
- 11 DRAM Clocks
- 12 DRAM Clocks
- 13 DRAM Clocks
- 14 DRAM Clocks
- 15 DRAM Clocks **DEFAULT**

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**	**DEFAULT**	Memory is not reserved for ISA expansion cards
➔ **15MB – 16MB**		Between 15MB and 16MB of memory is reserved for ISA expansion cards

➔ **Initiate Graphics Adapter [PEG/PCI]**

Use the **Initiate Graphics Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD

- PEG/IGD
- PEG/PCI **DEFAULT**
- PCI/PEG
- PCI/IGD

➔ **Internal Graphics Mode Select [Enable, 32MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**

➔ **Enable, 1MB** 1MB of memory used by internal graphics device

➔ **Enable, 8MB** **DEFAULT** 8MB of memory used by internal graphics device

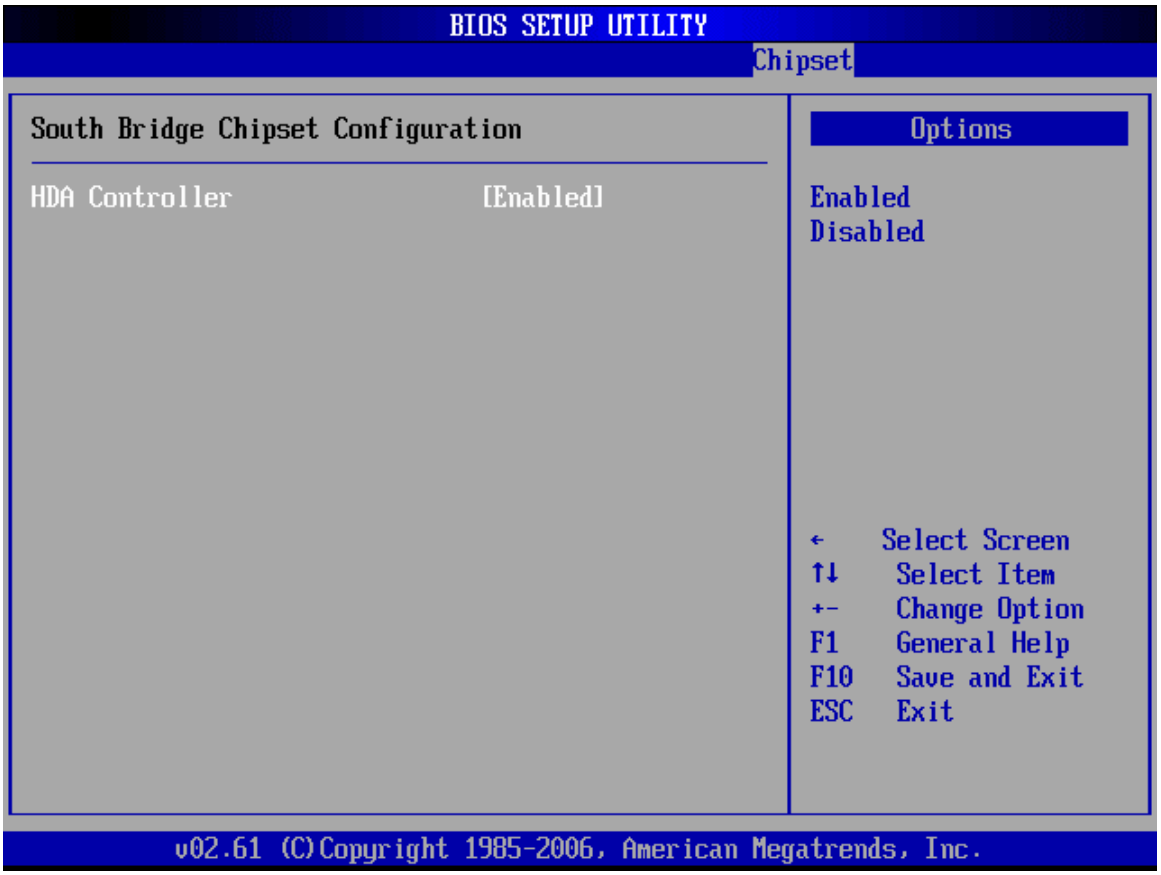
➔ **Boot Display Device [Auto]**

Use the **Boot Display Device** option to select the graphics controller used as the primary boot device. Configuration options are listed below:

- Auto **DEFAULT**
- CRT
- CRT1
- CRT + CRT1

6.7.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (BIOS Menu 20) the southbridge chipset to be configured.



BIOS Menu 20:SouthBridge Chipset Configuration

➔ **HDA Controller [Enabled]**

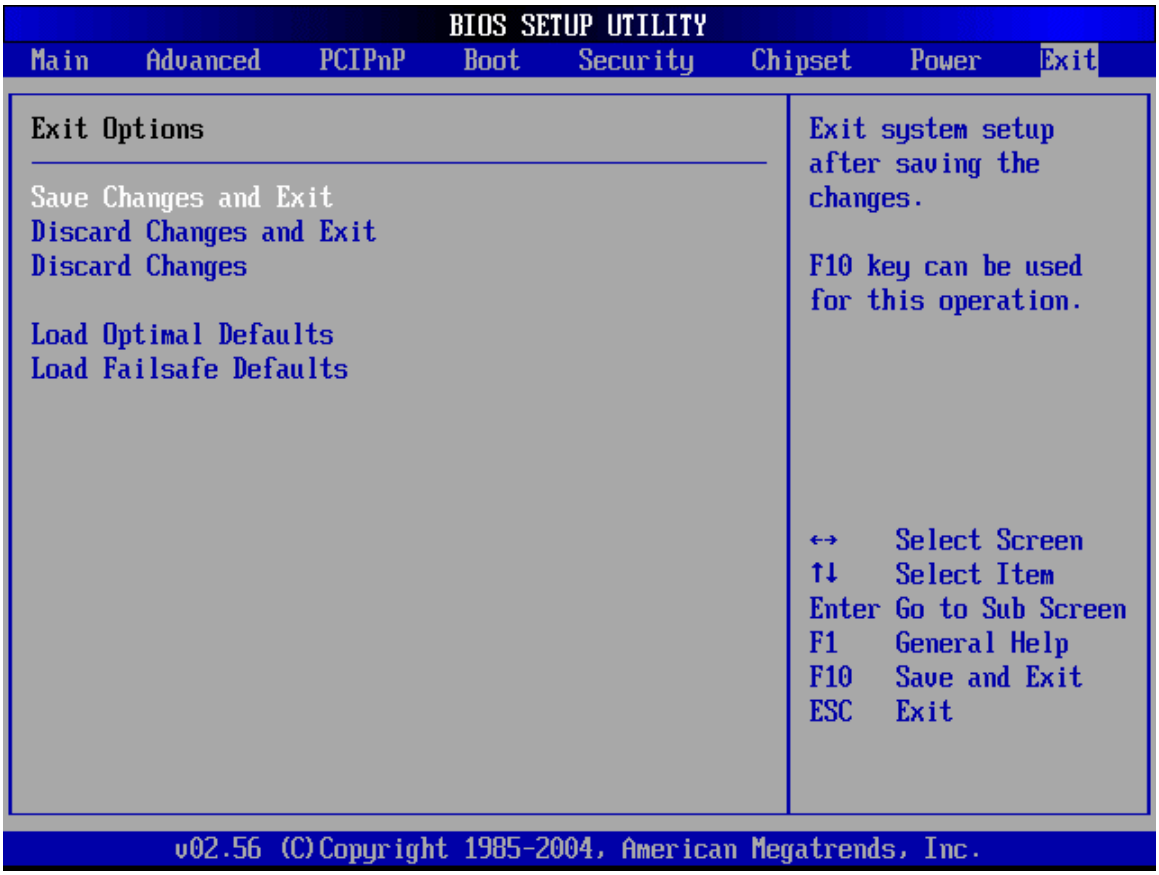
Use the **HDA Controller** option to enable the high definition audio controller.

➔ **Disabled** HDA controller disabled

➔ **Enabled** (Default) HDA controller enabled

6.8 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.56 (C)Copyright 1985-2004, American Megatrends, Inc.

BIOS Menu 21:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

7

Software Installation

7.1 Available Software Drivers

This chapter outlines the installation of the PCIE-9650's software drivers.

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset Driver (Intel® Chipset driver) 138
- VGA driver (Intel® Graphics Media Accelerator Driver)... 140
- LAN driver (Intel® PC82573L) 144
- Audio driver (Realtek HD Audio Driver (ALC883)) 149
- SATA driver (Intel® Matrix Storage Manager) 155

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the PCIE-9650 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 7-1**).

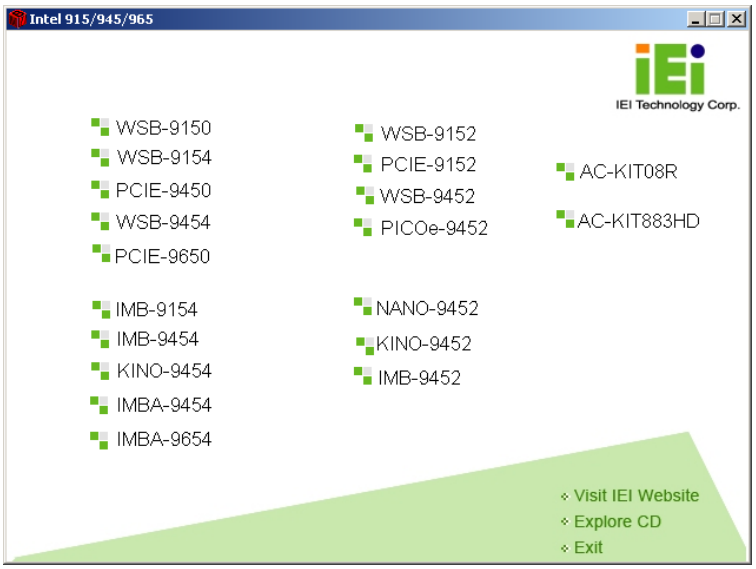


Figure 7-1: Introduction Screen

Step 3: Click PCIE-9650.

Step 4: A new screen with a list of available drivers appears (Figure 7-2).

Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**. Detailed driver installation instructions follow below.

7.3 Chipset Driver

To install the chipset driver, please follow the steps below.

Step 1: Select **INF** from the list in **Figure 7-2**.

Step 2: A new window opens (Figure 7-3).

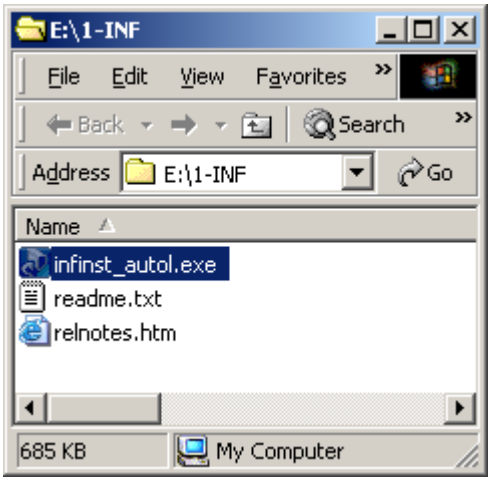


Figure 7-3: Chipset Driver Installation Program

Step 3: Double-click the **infinst_Autol.exe** icon.

Step 4: The welcome screen in **Figure 7-4** appears.

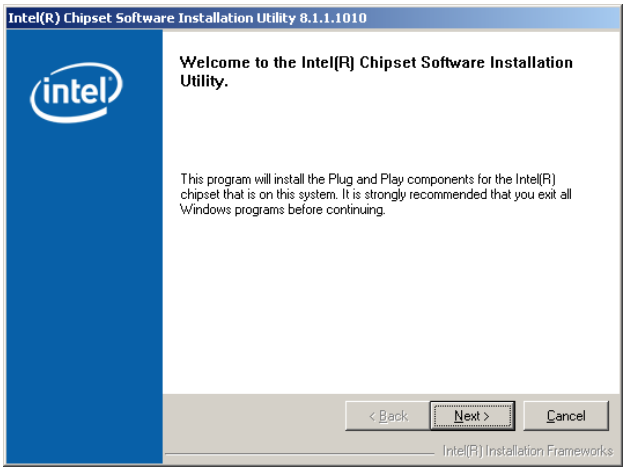

Intel(R) Chipset Software Installation Utility 8.1.1.1010
intel
Welcome to the Intel(R) Chipset Software Installation Utility.
This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 5: Click **NEXT** to continue the installation process.

Step 6: The license agreement in **Figure 7-5** appears.

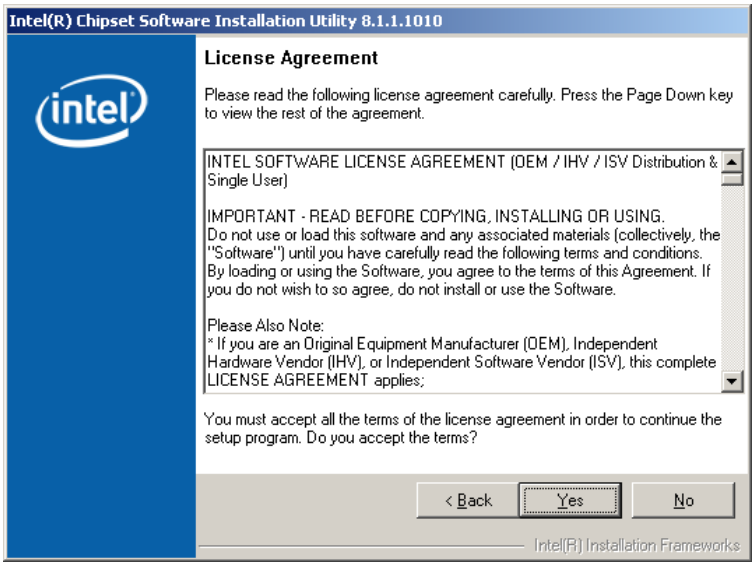

Intel(R) Chipset Software Installation Utility 8.1.1.1010
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-5: Chipset Driver Installation License Agreement

Step 7: Read the license agreement. To accept the terms and conditions stipulated in the agreement, click **YES**.

Step 8: The Readme file in Figure 7-6 appears.

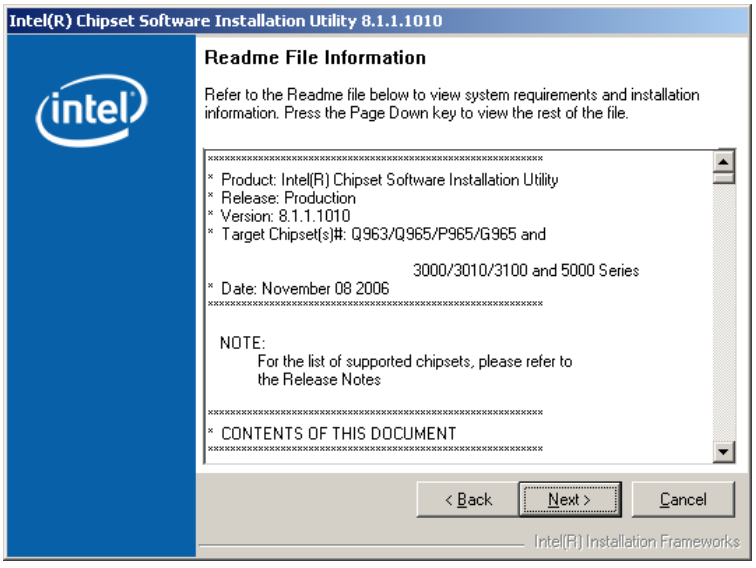

Intel(R) Chipset Software Installation Utility 8.1.1.1010
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 8.1.1.1010
* Target Chipset(s)#: Q963/Q965/P965/G965 and
3000/3010/3100 and 5000 Series
* Date: November 08 2006
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-6: Chipset Driver Readme File Information

Step 9: Read the Readme file information and then click **NEXT** to start the driver installation.

Step 10: After the driver installation process is complete, a confirmation screen appears (**Figure 7-7**).

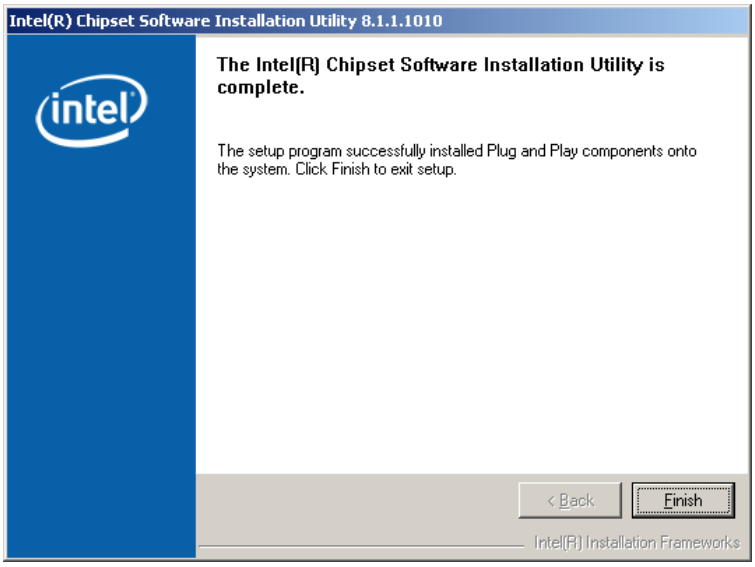

Intel(R) Chipset Software Installation Utility 8.1.1.1010
The Intel(R) Chipset Software Installation Utility is complete.
The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-7: Chipset Driver Installation Complete

Step 11: Click **FINISH** to complete the driver installation.

7.4 VGA Driver

To install the chipset driver, please follow the steps below.

Step 1: Select the VGA driver from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-8**).

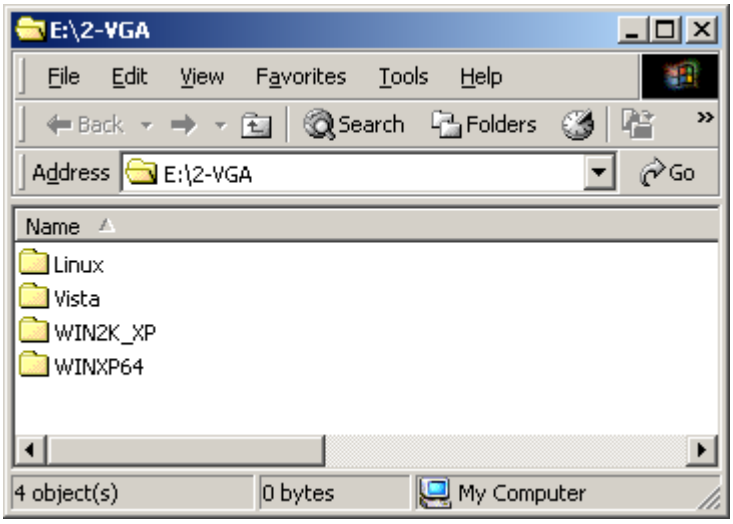


Figure 7-8: Select the Operating System

Step 3: Double-click the appropriate operating system folder.

Step 4: A new window appears (**Figure 7-9**).

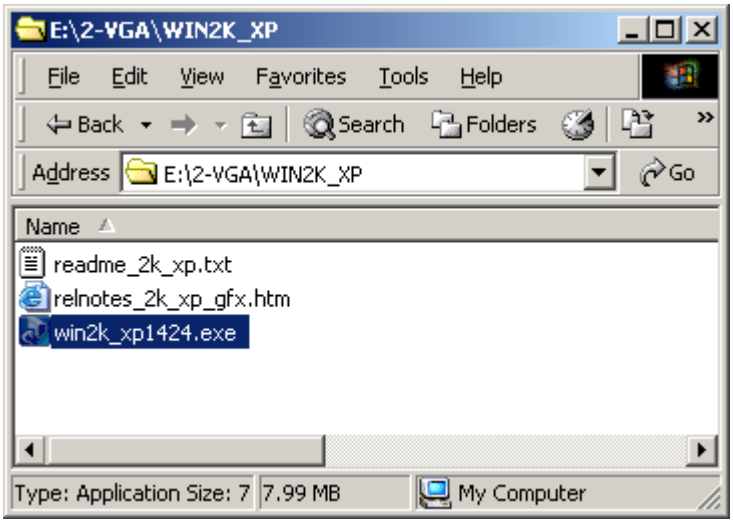


Figure 7-9: VGA Driver

Step 5: Double-click the installation program icon to continue the installation process.

Step 6: The Readme information file shown in **Figure 7-10** appears.

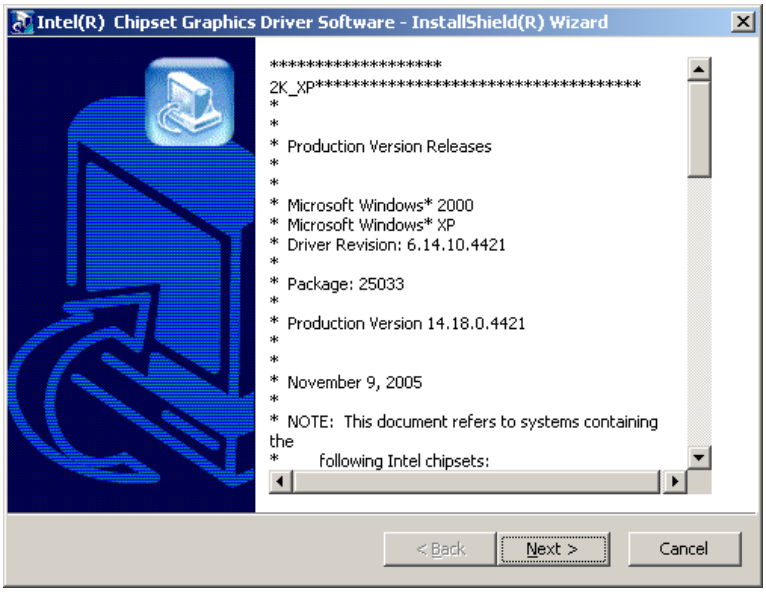


Figure 7-10: Intel® Graphics Media Accelerator InstallShield Wizard

Step 7: Read the Readme file information and click **NEXT** to begin extracting files (**Figure 7-11**).

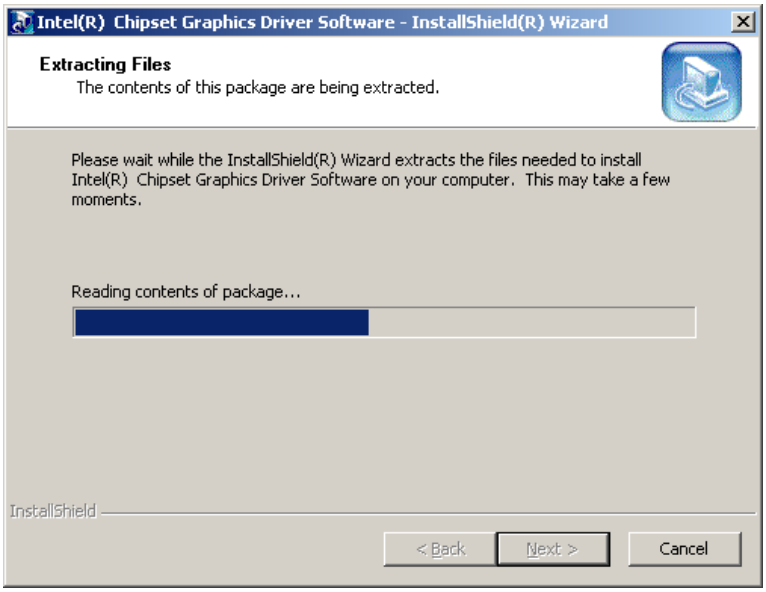

Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-11: InstallShield Wizard Extracting Files

Step 8: The **Graphics Media Accelerator Driver Welcome** screen appears (Figure 7-12).

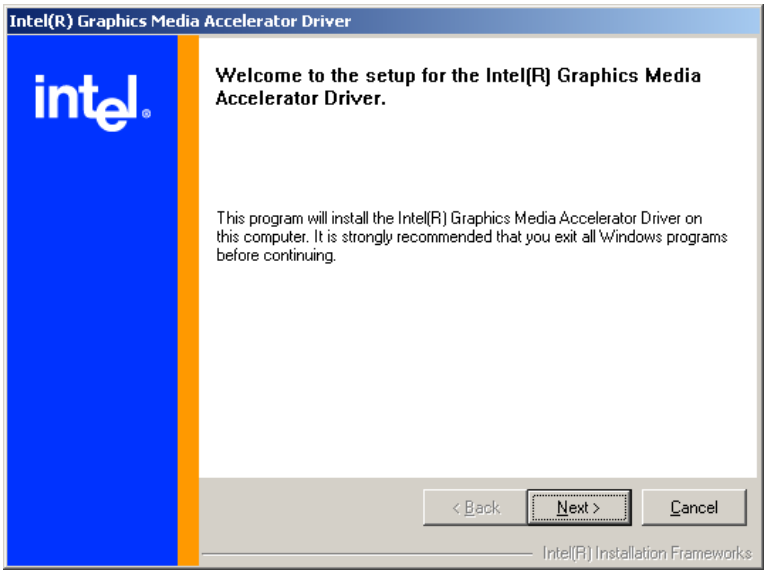

Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-12: Intel® Graphics Media Accelerator Driver Welcome Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-13**).

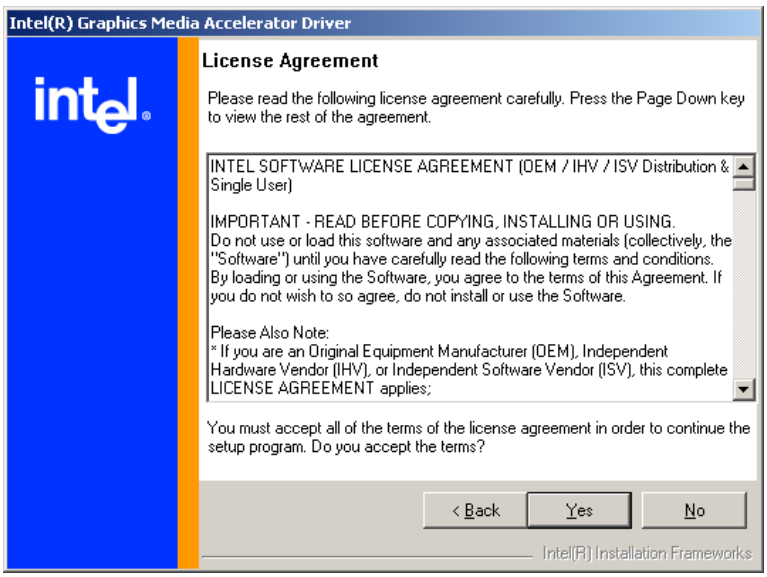

Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-13: Intel® Graphics Media Accelerator Driver License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the installation notice appears (**Figure 7-14**) as the driver is installed.

Figure 7-14: Intel® Graphics Media Accelerator Driver Installing Notice

Step 11: After the driver installation process is complete, a confirmation screen appears (**Figure 7-15**).

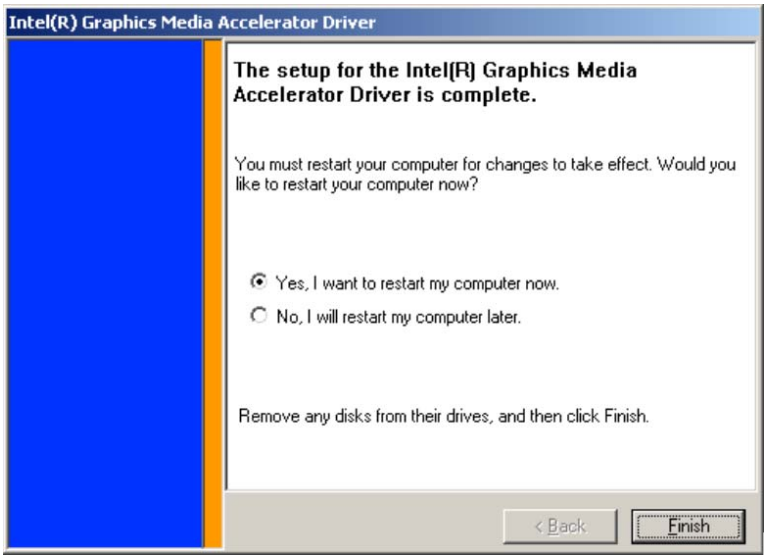

Intel(R) Graphics Media Accelerator Driver
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart your computer for changes to take effect. Would you like to restart your computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish

Figure 7-15: Intel® Graphics Media Accelerator Installation Complete

Step 12: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.5 LAN Driver

To install the Intel® Network Adapter, please follow the steps below.

Step 1: Select the LAN driver from the list in **Figure 7-2**.

Step 2: A new window opens **(**Figure 7-16).

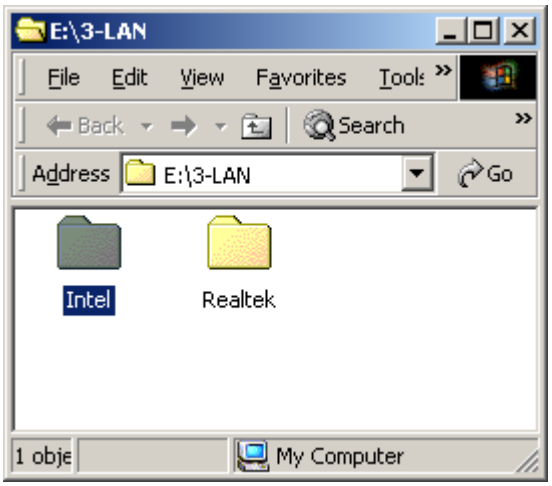


Figure 7-16: Select the Driver Folder

Step 3: Double-click the Intel folder.

Step 4: A new window appears (Figure 7-17).

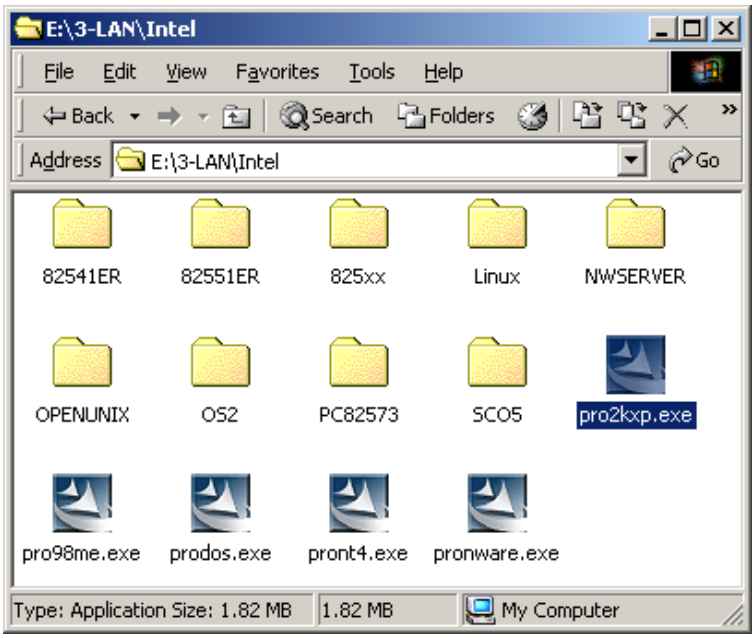


Figure 7-17: Select the Driver

Step 5: Double-click the appropriate installation program icon to continue the installation process.

Step 6: The license agreement in Figure 7-18 appears.

DriverInstaller - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

Figure 7-18: Network Adapter License Agreement

Step 7: Read the license agreement. To accept the terms and conditions stipulated in the agreement, select "**I accept the terms**…" and click **NEXT**.

Step 8: The **Location to Save Files** window (Figure 7-19) appears.

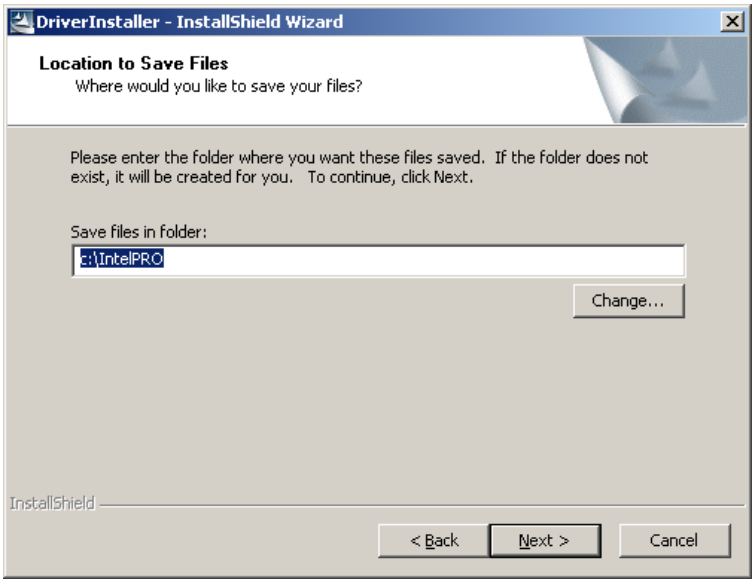

DriverInstaller - InstallShield Wizard
Location to Save Files
Where would you like to save your files?
Please enter the folder where you want these files saved. If the folder does not exist, it will be created for you. To continue, click Next.
Save files in folder:
c:\IntelPRO
Change...
InstallShield
< Back
Next >
Cancel

Figure 7-19: Location to Save Files

Step 9: Click **NEXT** to accept the default folder and begin extracting files (Figure 7-20).

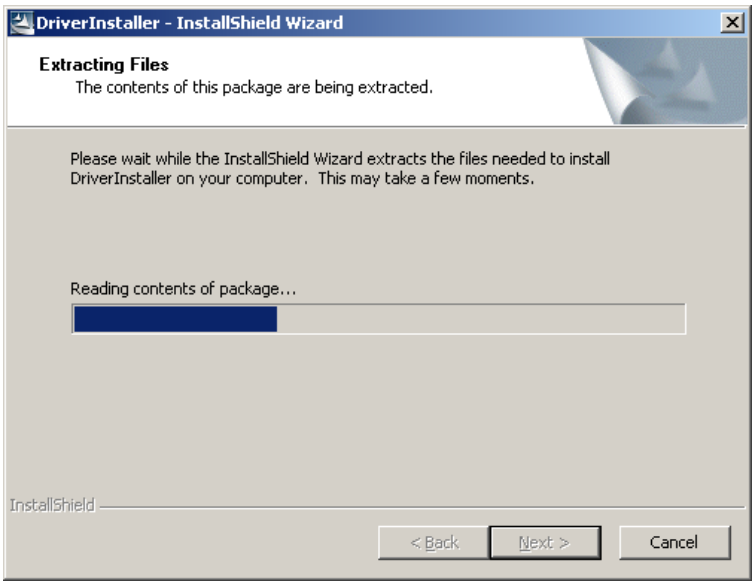

DriverInstaller - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install DriverInstaller on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-20: InstallShield Wizard Extracting Files

Step 10: If the **Overwrite Protection** window appears (**Figure 7-21**), make the appropriate choice to either continue the installation process or not.

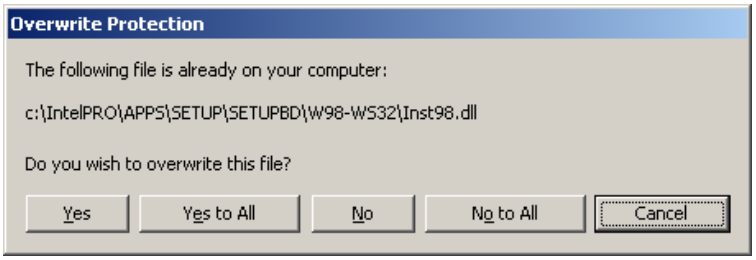


Figure 7-21: Overwrite Protection

Step 11: File extraction continues (**Figure 7-22**).

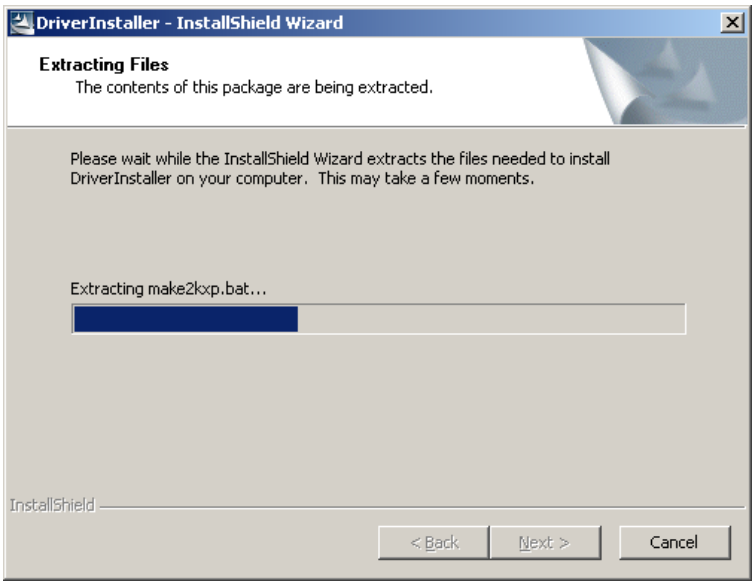

DriverInstaller - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install DriverInstaller on your computer. This may take a few moments.
Extracting make2kxp.bat...
InstallShield
< Back
Next >
Cancel

Figure 7-22: File Extraction Continues

Step 12: The **Intel® Pro Network Connections** window appears (Figure 7-23).

Figure 7-23: Intel® Pro Network Connections

Step 13: Click **Install Base Driver** and an installation notice appears (Figure 7-24) as the driver is installed.

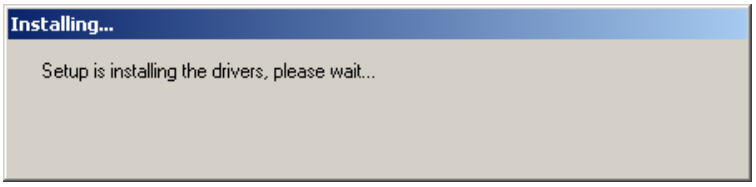


Figure 7-24: Intel® Pro Network Connections Driver Installation Notice

Step 14: After the driver is installed click **EXIT** in the **Intel® Pro Network Connections** window to exit the program.

7.6 Audio Driver

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [Azalia].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select **AUDIO** from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-25**).

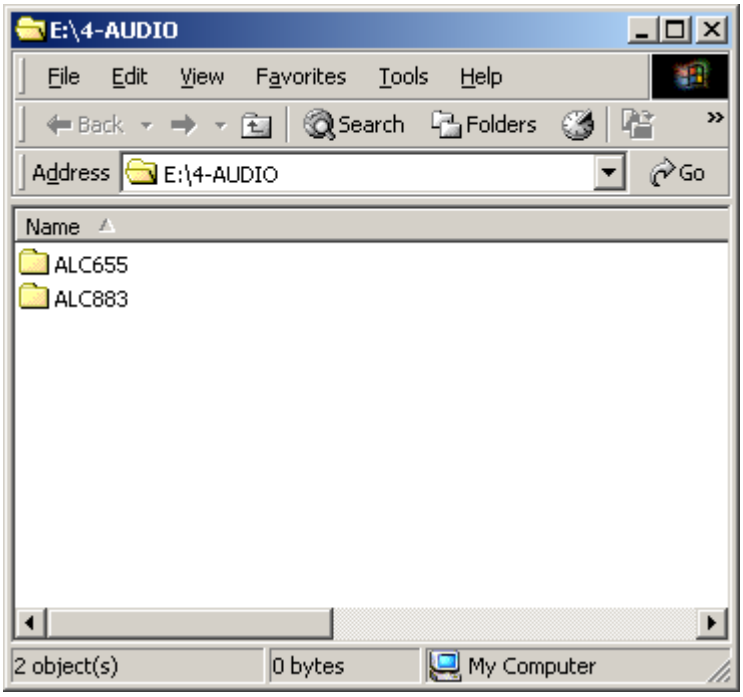


Figure 7-25: Select the Audio CODEC

Step 3: Double-click the ALC883 folder.

Step 4: Double-click the appropriate operating system folder (**Figure 7-26**).

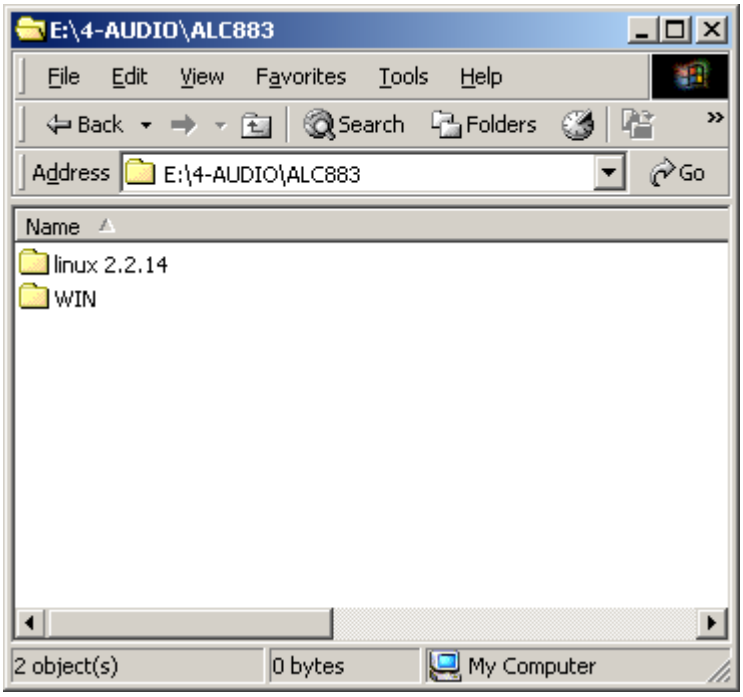


Figure 7-26: Select the OS

Step 5: Double-click the appropriate operating system version folder (**Figure 7-27**).

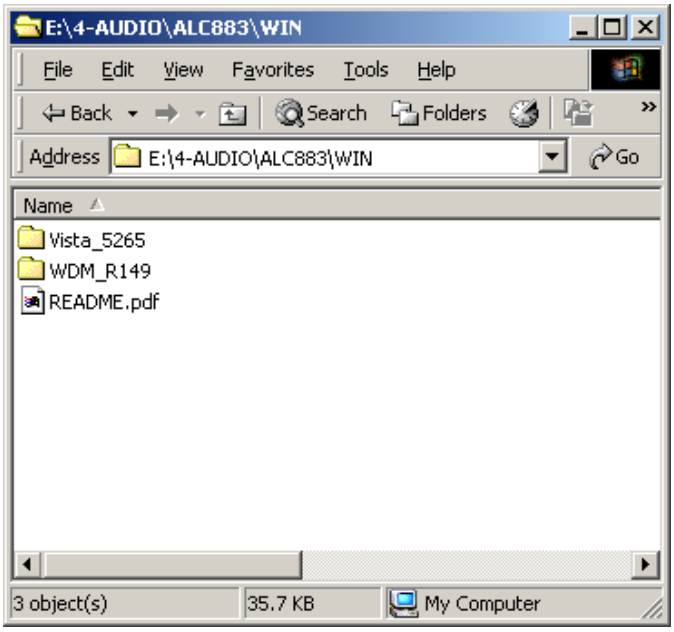


Figure 7-27: Select the OS Version

Step 6: Double-click the **Setup.exe** program icon in **Figure 7-28**.

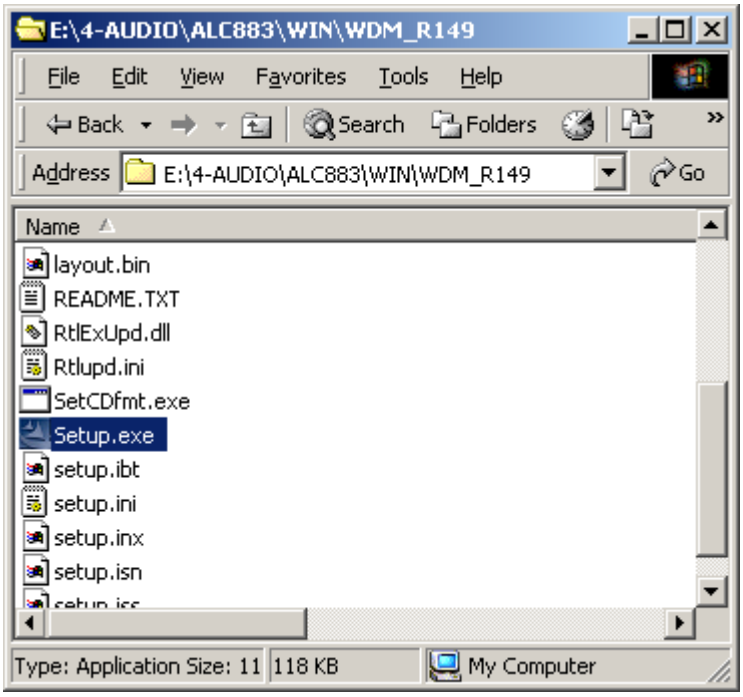


Figure 7-28: Locate the Setup Program Icon

Step 7: The **InstallShield Wizard** starts (**Figure 7-29**).

Figure 7-29: The InstallShield Wizard Starts

Step 8: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 7-30**).

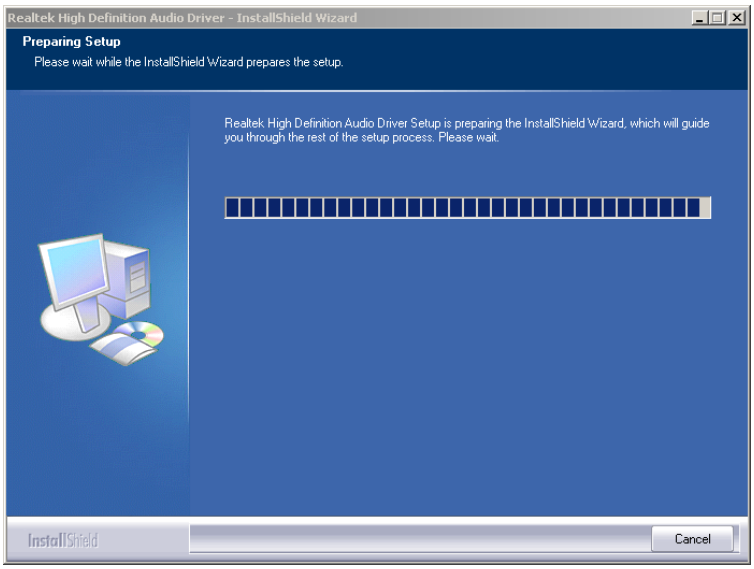

Realtek High Definition Audio Driver - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Realtek High Definition Audio Driver Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-30: Preparing Setup Screen

Step 9: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 7-31**).

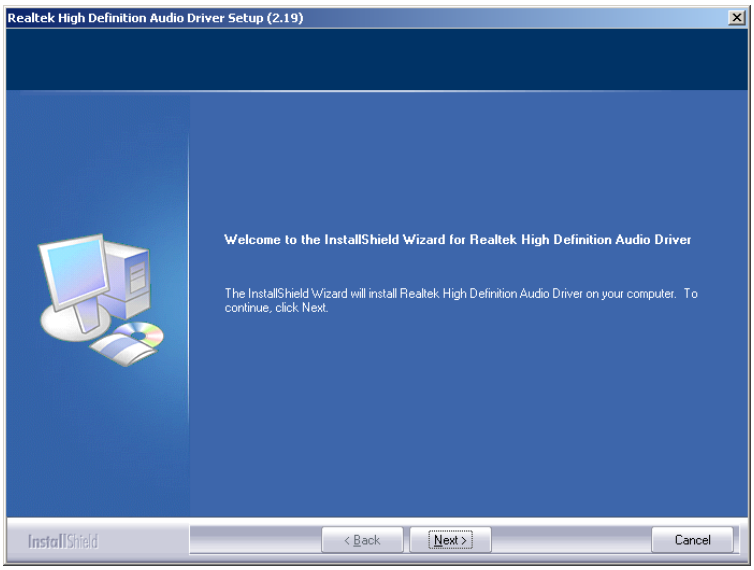

Realtek High Definition Audio Driver Setup (2.19)
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 7-31: InstallShield Wizard Welcome Screen

Step 10: Click **NEXT** to continue the installation.

Step 11: InstallShield starts to install the new software as shown in Figure 7-32.

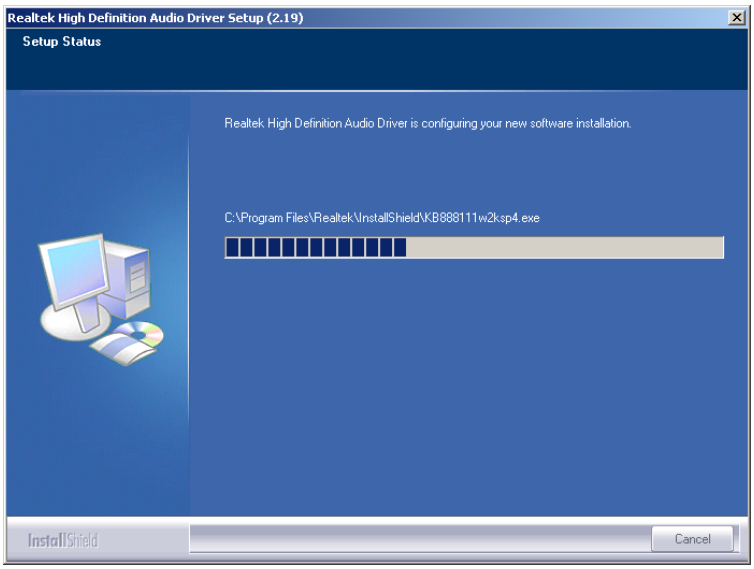

Realtek High Definition Audio Driver Setup (2.19)
Setup Status
Realtek High Definition Audio Driver is configuring your new software installation.
C:\Program Files\Realtek\InstallShield\KB888111w2ksp4.exe
InstallShield
Cancel

Figure 7-32: Audio Driver Software Configuration

Step 12: The Installation Wizard updates the system as shown in Figure 7-33.

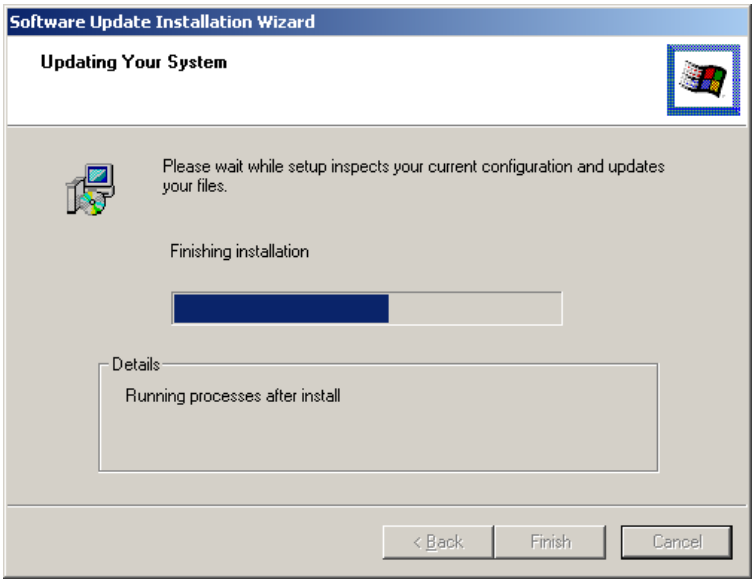


Figure 7-33: Installation Wizard Updates the System

Step 13: After the driver installation process is complete, a confirmation screen appears (**Figure 7-34**).

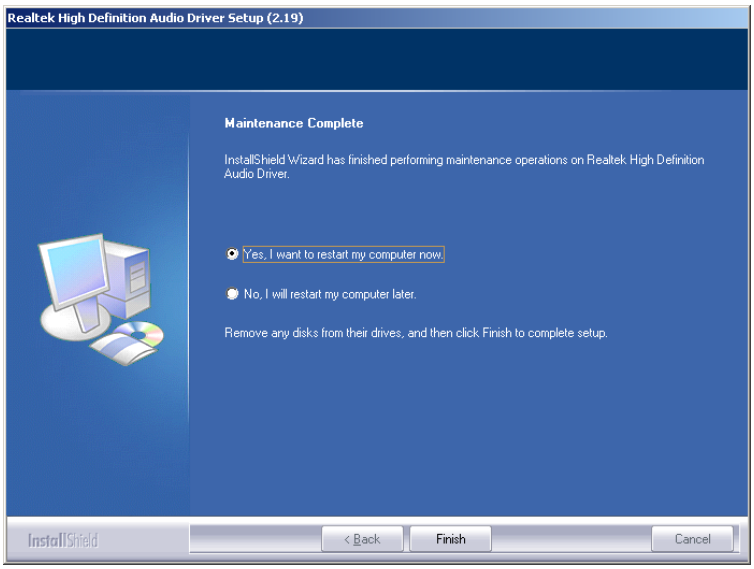

Realtek High Definition Audio Driver Setup (2.19)
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on Realtek High Definition Audio Driver.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 7-34: Restart the Computer

Step 14: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.7 SATA Driver

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select **SATA** from the list in **Figure 7-2**.

Step 2: A new window opens (Figure 7-35).

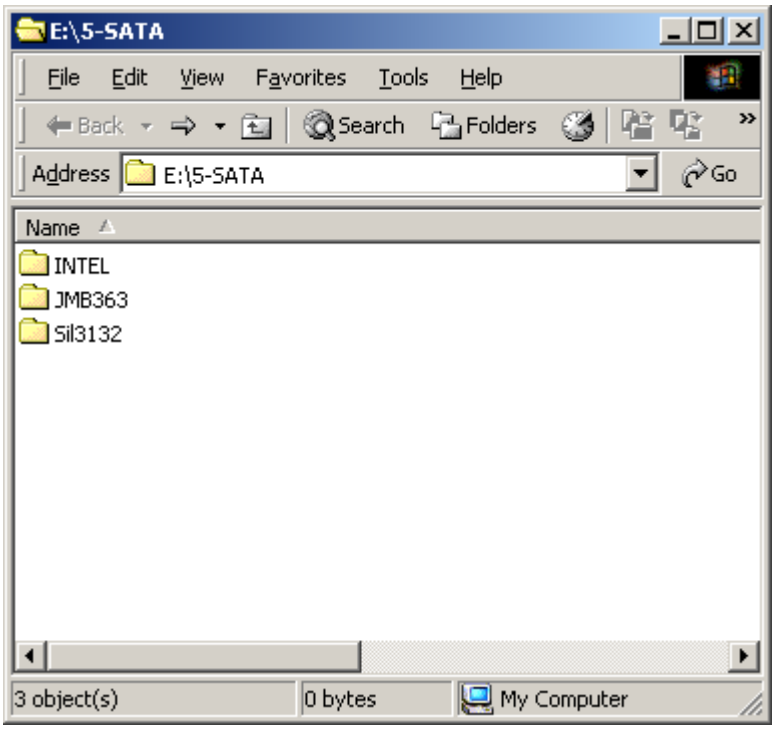


Figure 7-35: SATA RAID Driver Installation Program

Step 3: Double-click the **INTEL** folder.

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-36**.

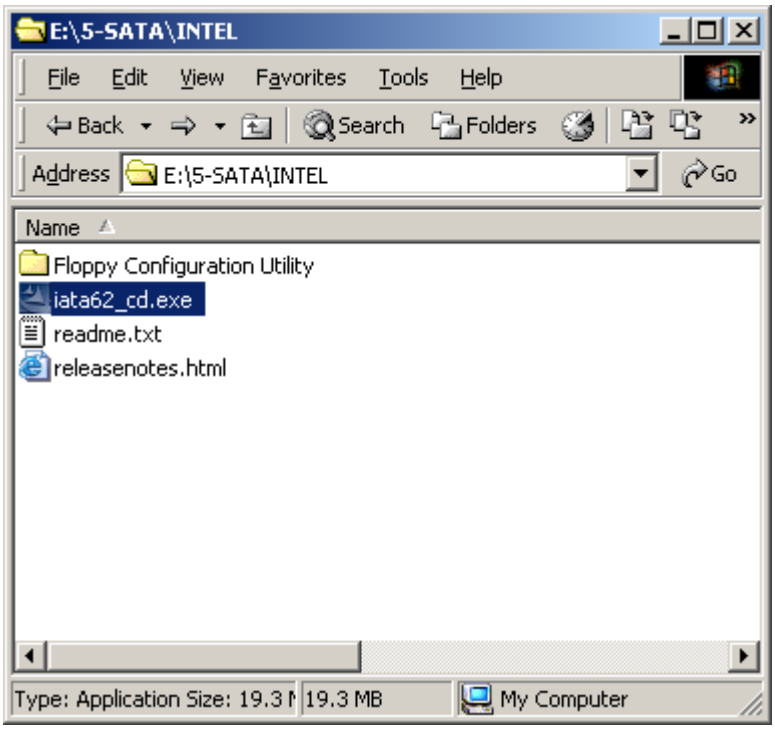


Figure 7-36: SATA RAID Setup Program Icon

Step 5: **Figure 7-37** shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

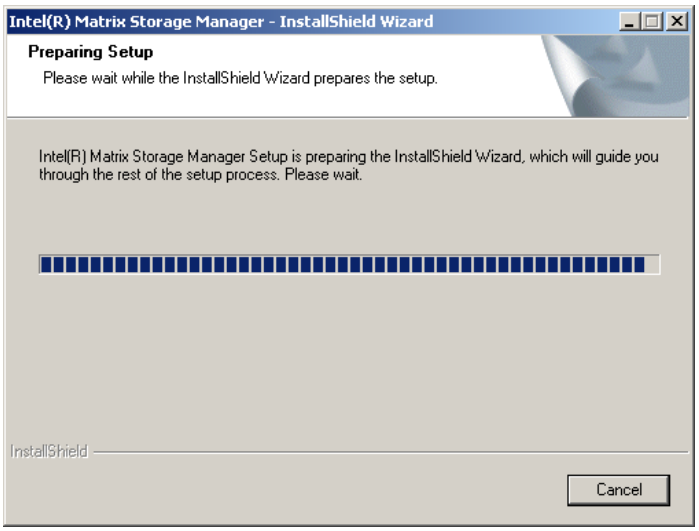

Intel(R) Matrix Storage Manager - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Intel(R) Matrix Storage Manager Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-37: InstallShield Wizard Setup Screen

Step 6: **Figure 7-38** shows the **Matrix Storage Manager** software configuring the installation process.

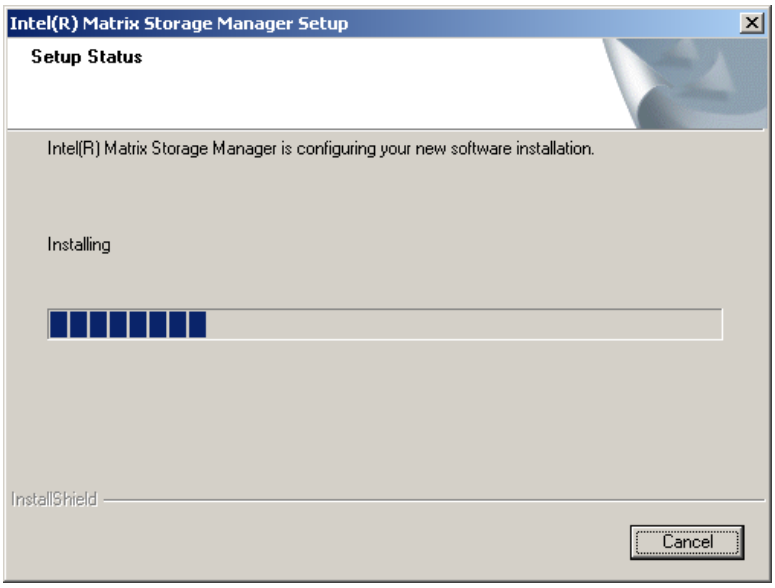


Figure 7-38: Matrix Storage Manager Setup Screen

Step 7: **Figure 7-39** shows the **Matrix Storage Manager** welcome screen.

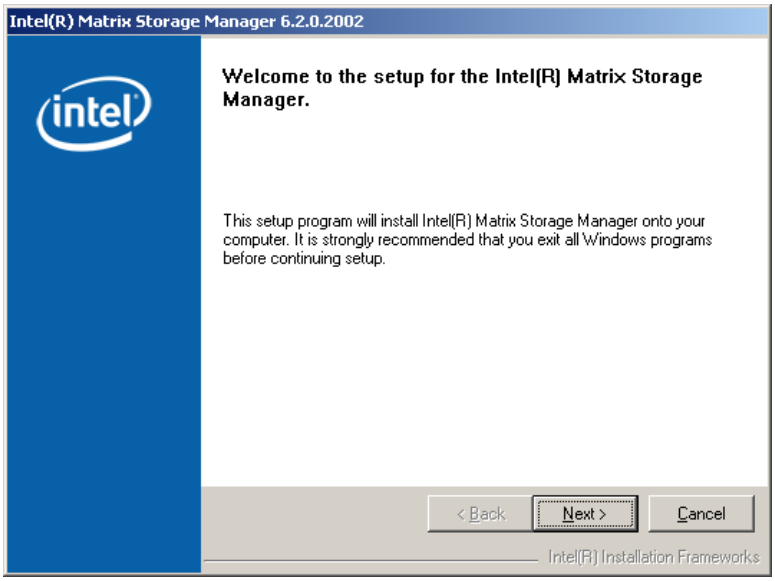

Intel(R) Matrix Storage Manager 6.2.0.2002
intel
Welcome to the setup for the Intel(R) Matrix Storage Manager.
This setup program will install Intel(R) Matrix Storage Manager onto your computer. It is strongly recommended that you exit all Windows programs before continuing setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-39: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-40**). Read the warning carefully and decide whether or not to continue the installation process.

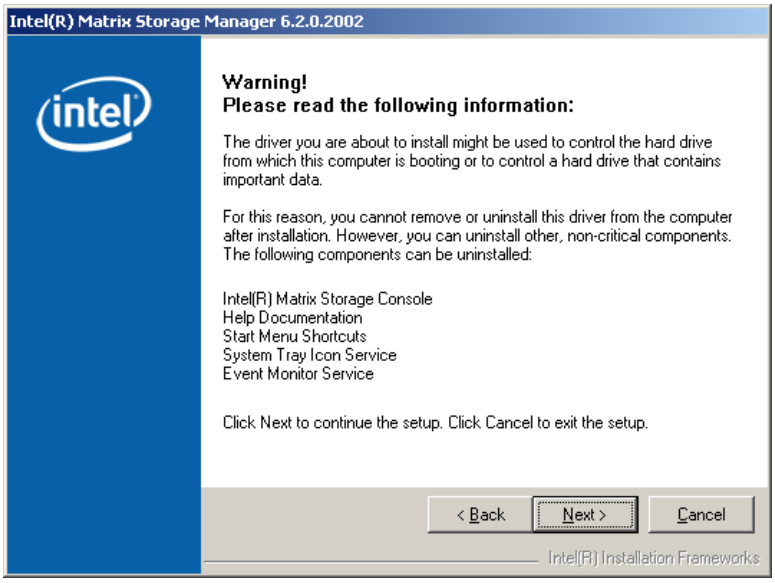

Intel(R) Matrix Storage Manager 6.2.0.2002
Warning!
Please read the following information:
The driver you are about to install might be used to control the hard drive from which this computer is booting or to control a hard drive that contains important data.
For this reason, you cannot remove or uninstall this driver from the computer after installation. However, you can uninstall other, non-critical components. The following components can be uninstalled:
Intel(R) Matrix Storage Console
Help Documentation
Start Menu Shortcuts
System Tray Icon Service
Event Monitor Service
Click Next to continue the setup. Click Cancel to exit the setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-40: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-41**).

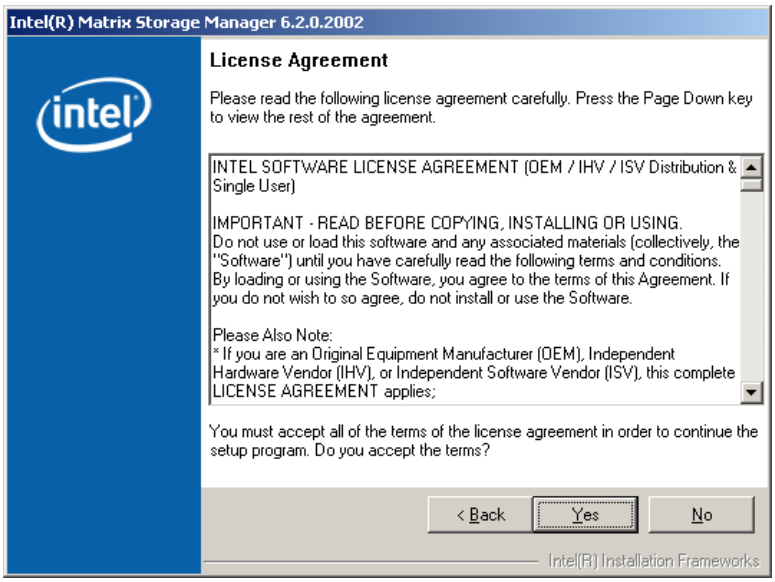

Intel(R) Matrix Storage Manager 6.2.0.2002
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-41: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-42** appears.

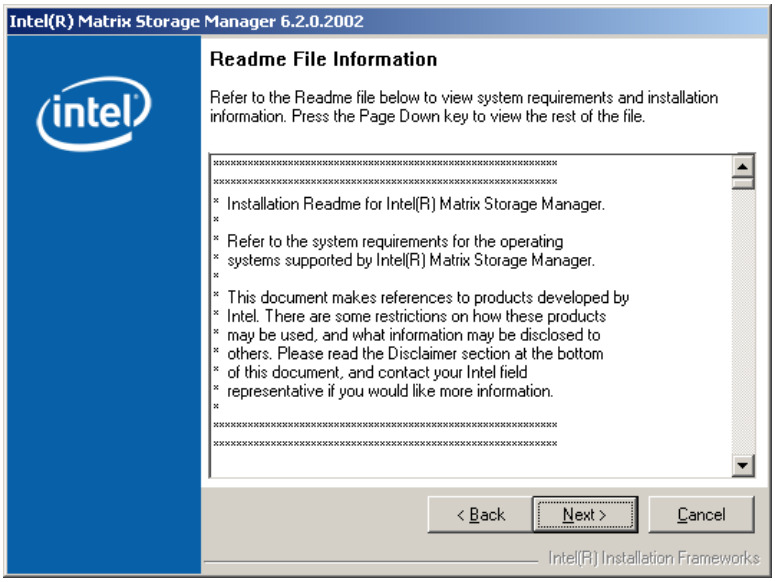

Intel(R) Matrix Storage Manager 6.2.0.2002
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Installation Readme for Intel(R) Matrix Storage Manager.
* Refer to the system requirements for the operating
* systems supported by Intel(R) Matrix Storage Manager.
* This document makes references to products developed by
* Intel. There are some restrictions on how these products
* may be used, and what information may be disclosed to
* others. Please read the Disclaimer section at the bottom
* of this document, and contact your Intel field
* representative if you would like more information.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-42: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-43**).

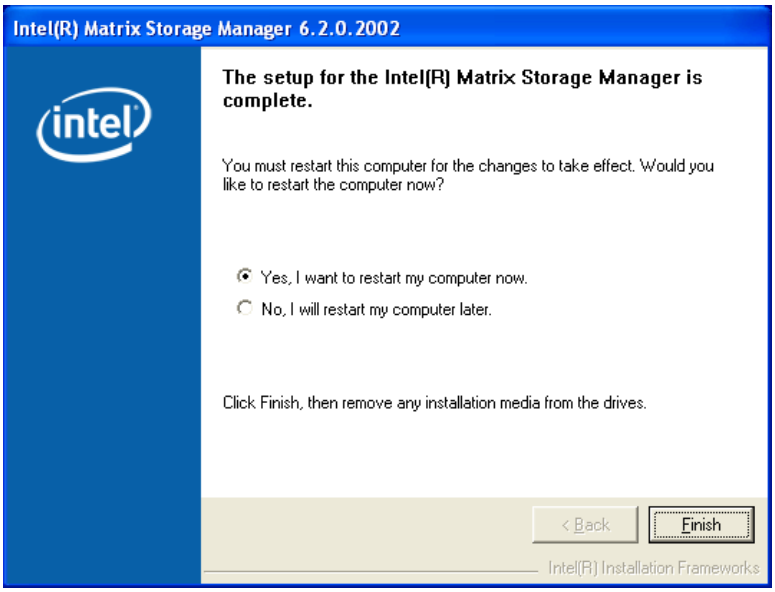

Intel(R) Matrix Storage Manager 6.2.0.2002
The setup for the Intel(R) Matrix Storage Manager is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish, then remove any installation media from the drives.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-43: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

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Appendix

A

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Appendix

B

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Digital I/O Interface

C.1 Introduction

The DIO connector on the PCIE-9650 is interfaced to GIO ports on the iTE Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the iTE Super I/O chipset.

C.2 Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	**AX, 6F08H**	Sets the digital port as input
INT	**15H**	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

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Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

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Appendix

E

Address Mapping

E.1 Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel Graphics Controller
3C0-3DF	Intel Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table E-1: IO Address Map

E.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table E-2: 1st MB Memory Address Map

E.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI

IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table E-3: IRQ Mapping Table

E.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table E-4: IRQ Mapping Table

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Appendix

F

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the PCIE-9650

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the PCIE-9650.

- MS-DOS 6.22
- Microsoft Windows XP (32-bit)
- Microsoft Windows 2000
- Red Hat 9.0

F.2 Compatible Processors

The following Intel® Socket P processors have been successfully tested on the PCIE-9650

CPU	FSB	Frequency
Intel® Core™2 Duo E6700	800MHz	2.66 GHz

F.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the PCIE-9650 other memory modules that comply with the specifications may also work on the PCIE-9650 but have not been tested.

The following memory modules have been successfully tested on the PCIE-9650.

Manufacturer	Capacity	Speed	Type
Transcend	2.0 GB	800 MHz	DDR2

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Appendix

G

Intel® Matrix Storage Manager

G.1 Introduction

The Intel® ICH8DO chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for faster access to non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

CAUTION:

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

G.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING:

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION:

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

G.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

G.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

Step 3: **Save and Exit BIOS**. After the **SATA** support option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl+I**. During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.

Step 6: **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

Step 7: **Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.

G.4 RAID Configuration

G.4.1 Creating a RAID Volume

WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create RAID Volume**." Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**.

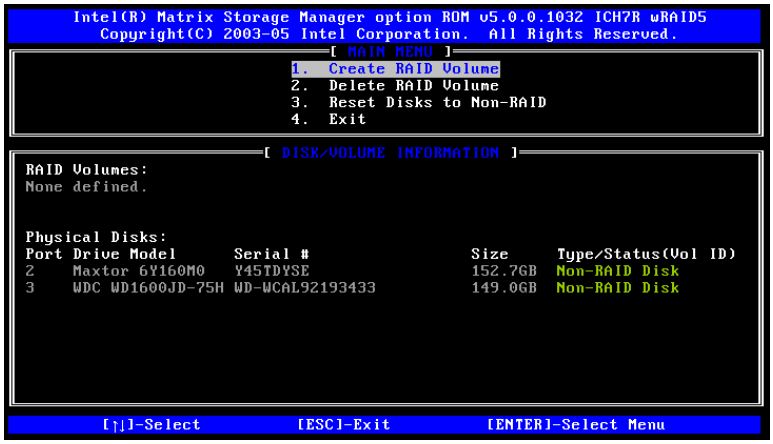
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-1: Matrix Storage Manager Main Menu

Step 2: **Name the RAID volume**. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.

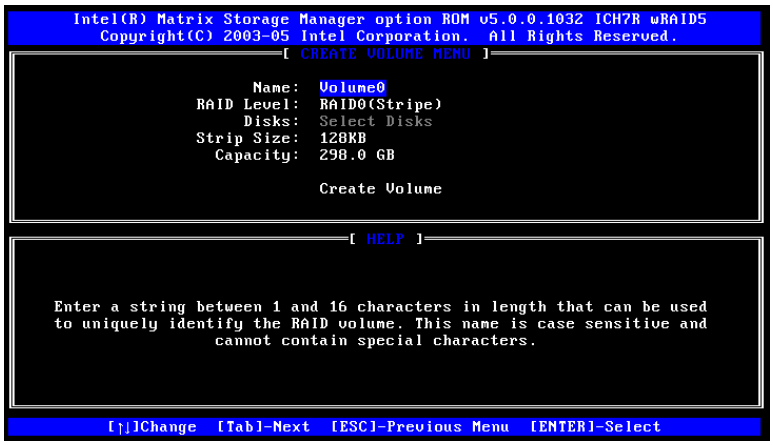
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and cannot contain special characters.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-2: Create RAID Volume Name

Step 3: **Choose the RAID level**. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10.

NOTE:

A RAID 0 or RAID 1 array requires a minimum of two hard drives.

A RAID 10 array requires four hard drives.

A RAID 5 array level requires a minimum of three hard drives.

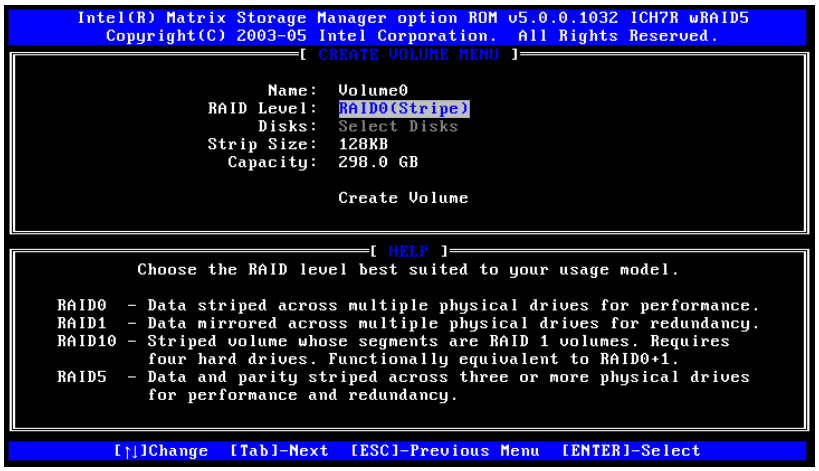
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Choose the RAID level best suited to your usage model.
RAID0 - Data striped across multiple physical drives for performance.
RAID1 - Data mirrored across multiple physical drives for redundancy.
RAID10 - Striped volume whose segments are RAID 1 volumes. Requires four hard drives. Functionally equivalent to RAID0+1.
RAID5 - Data and parity striped across three or more physical drives for performance and redundancy.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-3: Choose the Raid Level

Step 4: **Select the Stripe Size**. Select a stripe size from the list.

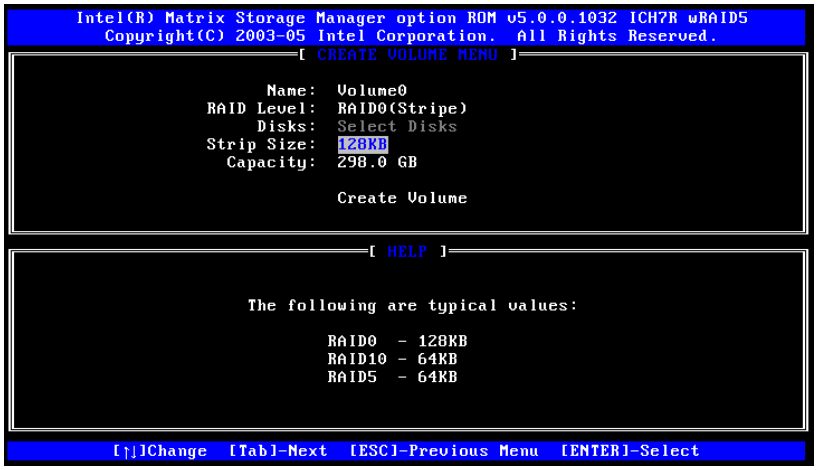

Figure G-4: Select the Stripe Size

Step 5: **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to accept the default capacity.

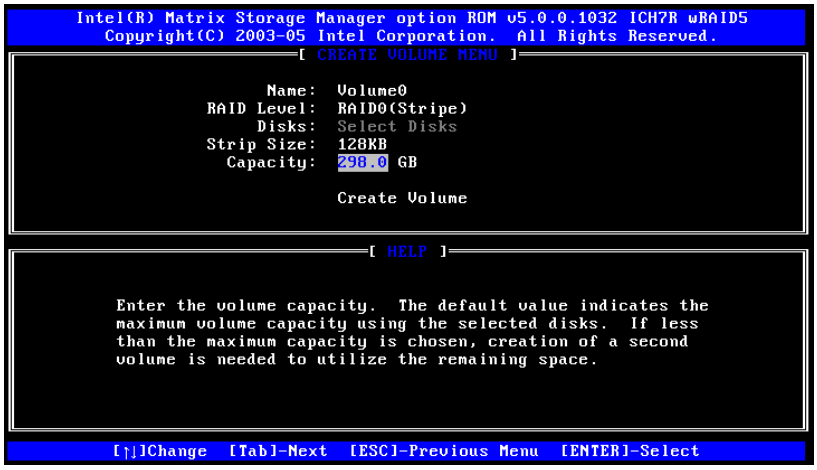
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter the volume capacity. The default value indicates the
maximum volume capacity using the selected disks. If less
than the maximum capacity is chosen, creation of a second
volume is needed to utilize the remaining space.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-5: Enter the Volume Capacity

Step 6: **Create the RAID Volume**. Press **ENTER** to create the RAID volume as specified.

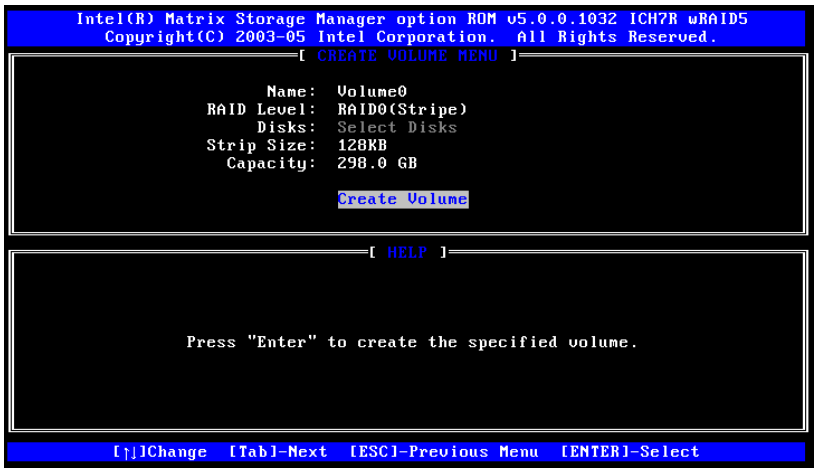
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-6: Create the RAID Volume

Step 7: **Create RAID Volume Verification**. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu.

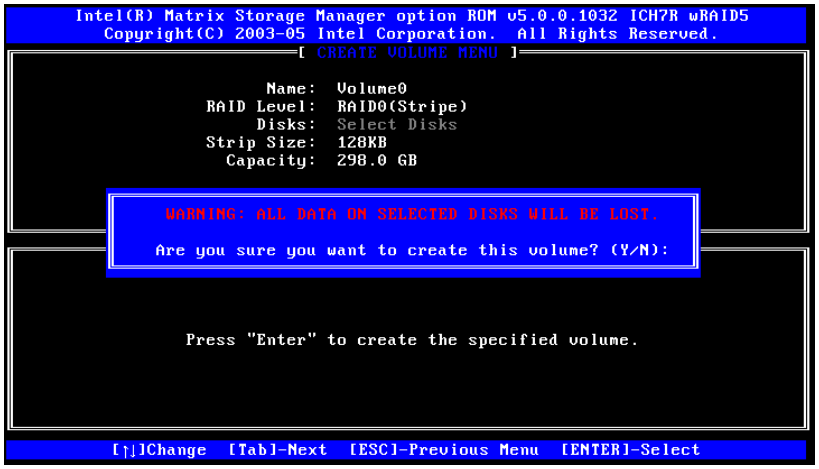
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-7: Create RAID Volume Verification

G.4.2 Deleting a RAID Volume

WARNING:

All data stored on the member drives of a RAID volume is destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

Step 1: **Select** "**Delete RAID Volume**." Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**.

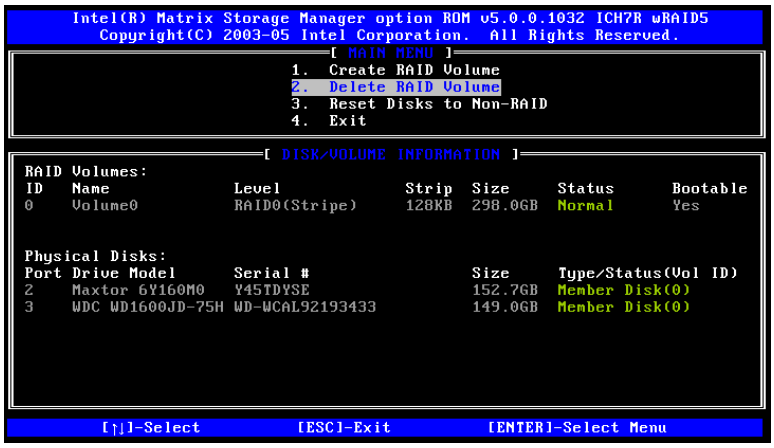
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-8: Delete RAID Volume Menu

Step 2: **Select RAID Volume to be Deleted**. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**.

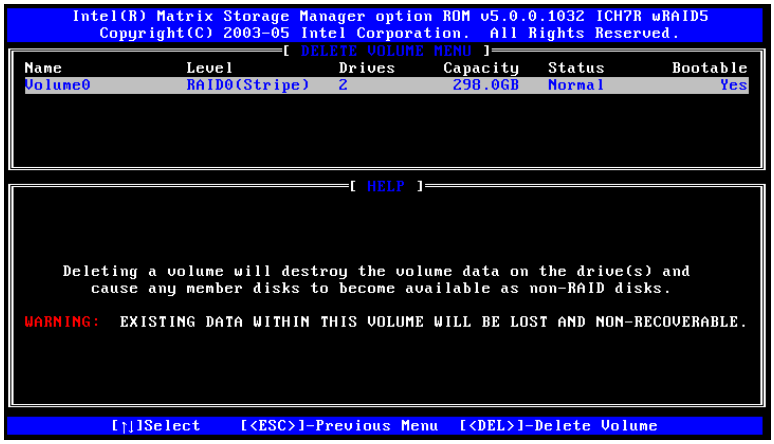
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[HELP]
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure G-9: Select RAID Volume to be Deleted

Step 3: **Delete Volume Verification**. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu.

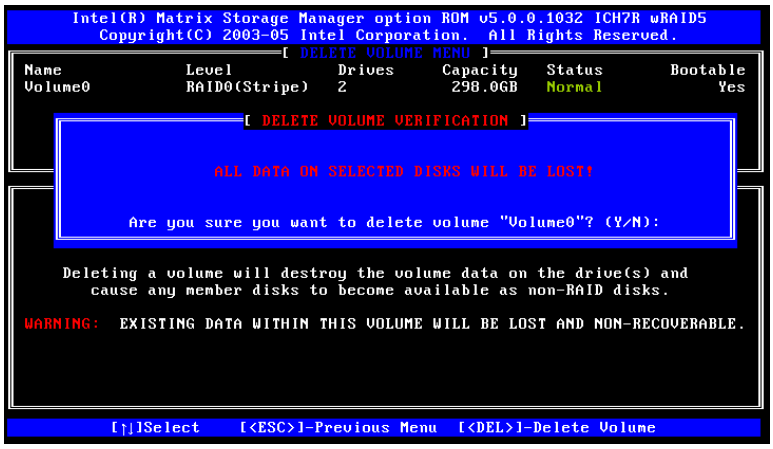
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[DELETE VOLUME VERIFICATION]
ALL DATA ON SELECTED DISKS WILL BE LOST!
Are you sure you want to delete volume "Volume0"? (Y/N):
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure G-10: Delete Volume Verification

Step 4: **Non-RAID Disks**. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks.

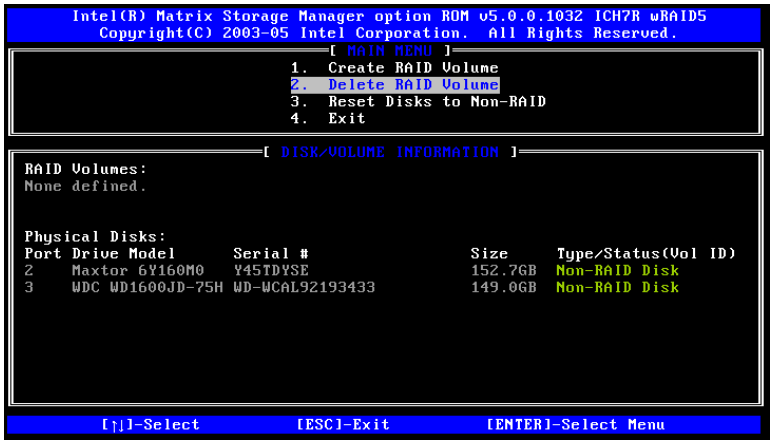
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-11: Non-RAID Disks

G.4.3 Resetting a Disk to Non-RAID

WARNING:

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: **Select** "**Reset Disk to Non-RAID**." Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**.

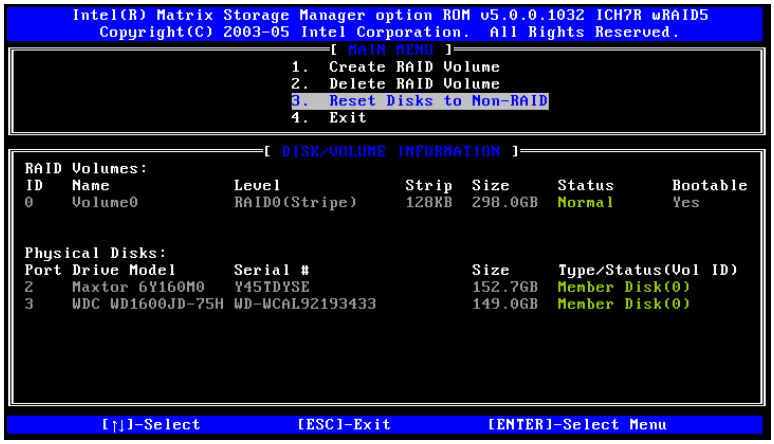
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-12: Reset Disk to Non-RAID Menu

Step 2: **Select Disks to Reset**. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**.

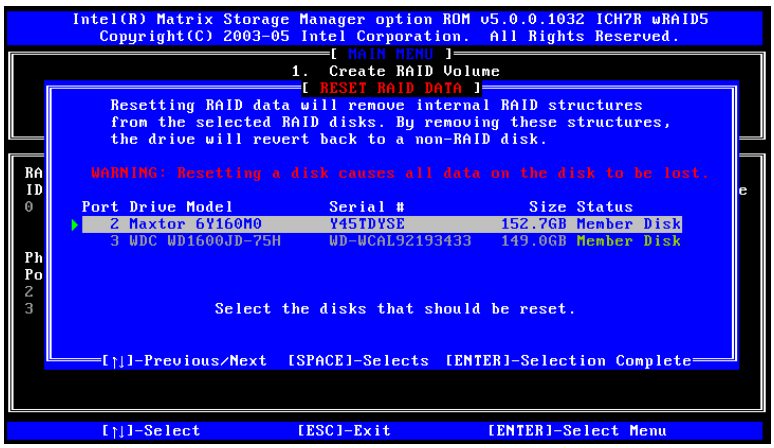
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-13: Select Disk to Reset

Step 3: **Reset Disk Verification**. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu.

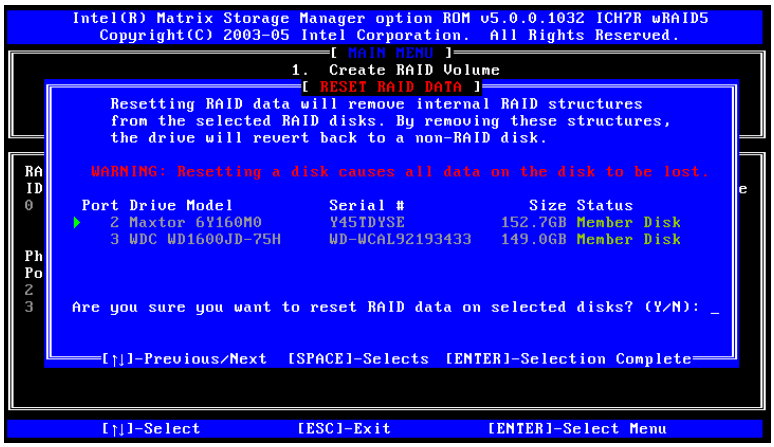
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Are you sure you want to reset RAID data on selected disks? (Y/N): _
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-14: Reset Disk Verification

Step 4: **Disk Drive and RAID Volume Status**. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives.

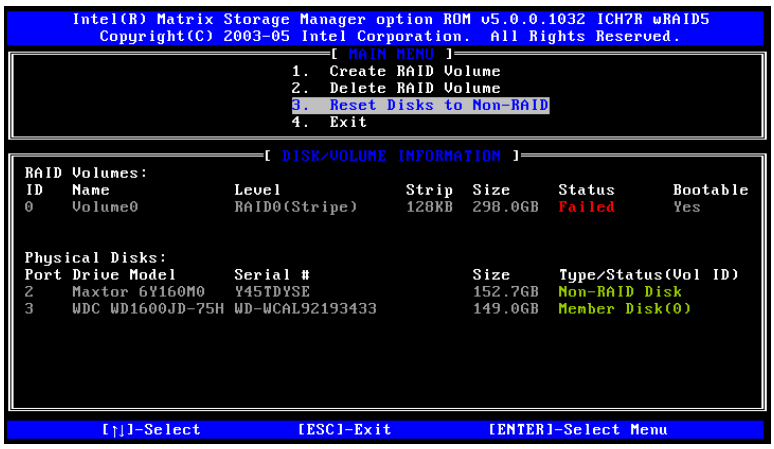
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-15: Disk Drive and RAID Volume Status

G.4.4 Exiting the Matrix Storage Manager

Step 1: **Select** "**Exit**." Use the arrow keys to highlight **Exit** and press **ENTER**.

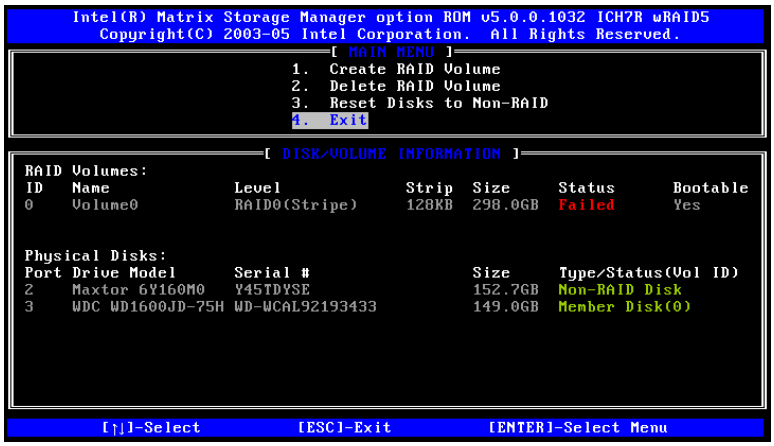
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-16: Exit Menu

Step 2: **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu.

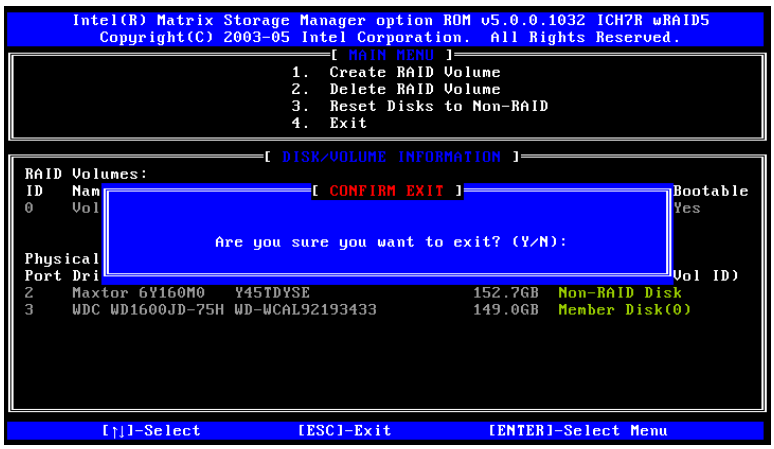
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
[CONFIRM EXIT]
Are you sure you want to exit? (Y/N):
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-17: Exit Verification

Appendix

H

Hazardous Materials Disclosure

H.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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